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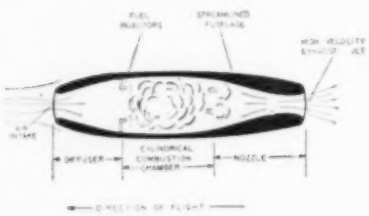
FLYING's COVER

A color photograph of ram jet engines in flight is among the rarest of aerial pictures. The exclusive color shot on the cover of FLYING shows an experimental flight of a Lockheed F-80A with auxiliary power of two ram jet engines installed one at each wing tip. Each engine is 30 inches in diameter.

For a short period of time Test Pilot Herman "Fish" Salmon drove the F-80 exclusively with the ram jet engines. Details of speed attained and other performance data are subjects of security.

Of the ram jet engine, Hall L. Hibbard, Chief Engineer of Lockheed, has said:

"Primary use of ram jet in the future will be as power for guided

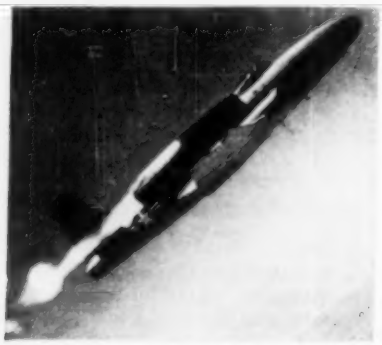


Ram Jet

missiles. It is good only for extremely high speeds—too fast for practical use with any man-carrying vehicle. For missiles, the ram jet will be very important.

"Lockheed's success in experiments with ram jet on an F-80 sharpened our engineers' thinking and research on possible future applications. These tests permitted a broad jump from the speed of the F-80 to much more advanced fields well into the supersonic ranges."

Test pilot Salmon's remarks were reputedly even briefer. He said, "Wow!"



THE COVER: Lockheed F-80A with ram jet engine. Photo-courtesy Lockheed Aircraft Corp.

SEPTEMBER, 1952 VOLUME 51, NUMBER 3

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CESSNA CASE HISTORIES

G. B. PACE, HUNTINGTON, WEST VA., vice-president of Pipeline Construction & Drilling Co., says, "Servicing a number of branch offices is difficult enough, but when they constantly move around—well, you can imagine our problem!" By "branch offices" Pace means current drilling jobs—and out of 10 projects, only 3 are permanent! He solved the knotty travel problem with a Cessna 170, now says, "We just couldn't operate without it!"

The plane is also used for transporting personnel and repair parts, patrolling pipelines and aerial photography. The firm recently bought 3 more Cessnas! Pace says, "We've never had a repair bill on any Cessna! We like their speed and all-metal construction, and our planes are comfortable even on long trips to Wyoming!"

ROY N. SIMMONS, ABILENE, KANS., bought a Cessna 170 on doctor's advice! As a CPA, he drove thousands of fatiguing miles a year to distant accounts before the Cessna. "Now," he says, "I fly to clients in Wyoming in 6½ hours, to Kansas City in 1¼ hours and to Harrisburg, Pa. in 10 hours (3 days by car!). Our 170 is ideal for easy traveling!"

Mrs. Simmons also flies, says, "Just from a health standpoint, our Cessna is invaluable. It handles so easily!" She flies to TB Assn. and "Ninety Nine" meetings. Their 170 is also used on vacations, and for flood relief. The Simmons' praise Cessna's visibility, roominess and economy, say, "We fly it for only 7.5¢ an hour, plus fuel!"

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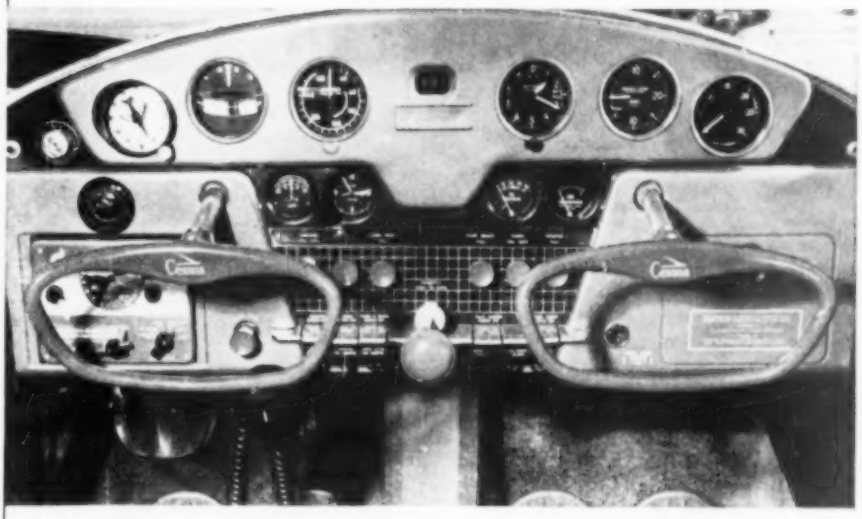

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FLYING
VOLUME 51, NO. 3
SEPTEMBER, 1952

AN EDITORIAL

THE BROAD BRUSH

The United States is sponsoring a titanic struggle to prevent collapse of human freedom.

The faith of our fathers and our own hopes alike are at stake.

The key to the issue is American air supremacy. Here above all we must architecture our salvation.

This is a matter not easily achieved. The foundations of such achievement are vision, insight and imagination . . . precious stuff to the best of human aspirations.

To achieve air supremacy it is not enough to have the best military planes and air bases . . . the most powerful bombs and fastest guns.

It is not enough to have the best trained pilots and the most adept mechanics.

It is not even enough to have the best air doctrine and the soundest air strategy.

These things are the superstructure of air supremacy . . . the parts that show above the surface. They are not the foundations.

The foundations lie in the intellectual and spiritual grasp of the people on the significance of the air age.

In 1945 the United States had world peace "in the bag." Our air supremacy ashore and afloat was the most potent force for international discipline since the heyday of British seapower.

Then, like quicksilver, peace slipped from our grasp. Having won an air war we had not the vision for an air age peace.

Oh yes, we made gestures toward the significance of air supremacy . . . a Strategic Air Survey . . . an Independent Air Force . . . the allotment of primary military functions among the defense services.

But these were not based on vision. They were merely gestures to placate the inexorable demands of a vivid experience . . . good as far as they went but short of a real objective.

They recognized the airplane as a weapon but not airpower as the primary instrument of national policy.

They recognized airpower as war power but not as peace power. They circumscribed rather than inspired. They paid lip service to airplanes but missed the concept of the air ocean upon whose shores lives every human being.

It is said that American air supremacy was lost after the war in the emotional surge to get the boys back home . . . that airpower merely suffered an equal debacle with all defense forces.

That is a misleading half truth. Dismemberment of the squadrons inferred no mere disbanding of troops. It destroyed the strategic control of the United States in the matter of fixing a durable peace. It exposed helpless free people to the will of rolling Red armies. It ignored the nature of air supremacy . . . continuity of research and development . . . the involvement of so many sciences such as electronics, nuclear fission, gas turbine power, metallurgy . . . the lead time essential between design and production . . . the creation of machine tooling for radically new manufacturing processes.

The logical fruits of the terrible thing we did are presently bitter on our tongues. Our aircraft industry writhes under the curbs of o'erweening government controls. Our creative ingenuity shrivels under lack of incentive. Our colleges and universities will require 15 years to come abreast of our needed output of engineers.

At the grass roots our youth is economically ruled out of activity. Education-wise we nibble at preparation of our boys and girls to lead the air age world. Manufacturers of personal planes are forced to direct sales efforts almost wholly toward business users who alone can afford them . . . an intolerable restriction of market.

The measure of our vision toward our mission has been unwittingly expressed in the phrase "butter and guns."

No expression could be more descriptive of our lost horizons. The production of butter and guns is far from the same thing as butter and air supremacy.

What we require is a sweeping national air policy by an Administration and a Congress which can handle a broad brush with insight, imagination and vision toward a Pax Americana of the air age.

Gill Robb Wilson

Gill Robb Wilson
Editor and Publisher

PLANE FAX

Quick picture of

PORTLAND INTERNATIONAL AIRPORT

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Night-lighted, multiple runway system . . . weather and communications . . . CAA regional offices on field . . . complete small plane and instrument service at Flightcraft, Inc. . . . . rental cars available . . . complete Standard Oil Aviation Service.

Small plane harbor at air hub of Pacific Northwest

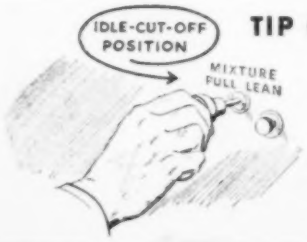
Si King, of Flightcraft, Inc., at Portland International Airport, tells this story of light plane service at a major airport:

"Many private pilots like a definite spot to hangar when they land at a big airport. And that's where our small plane 'harbor,' right on the field, plays an important role. Important, too, to flying businessmen is flight economy. And that's where Chevron 80/87 Gasoline stars. Our experience shows that Chevron 80/87 is the all-round outstanding buy for small plane engines. Not only does it provide top take-off power, it eliminates detonation, and proves its economy in low cruising consumption. Most of our plane owners have switched to it!

"We're located at the mouth of the Columbia River water level route to the East — and pilots from all over the Northwest converge here to

fly this route — especially in winter when 'high weather' can be unpredictable. They're sold on RPM Aviation Oil, too. The reason's plain. 'RPM' has increased our overhaul period more than 20% over other top grade oils. And when we take our engines down, we find clean valves and amazingly low ring wear. Big points — because they mean better engine performance, longer life and dollars saved."

T.M.'S "RPM," "CHEVRON," REG. U.S. PAT. OFF.



TIP OF THE MONTH

Always use the idle-cut-off position of your mixture control to kill your engine. This cleans the fuel from the cylinders and reduces the chances of inadvertent starting if the prop is turned while the engine is hot or if the ignition has been left on.

CHEVRON AVIATION GASOLINE

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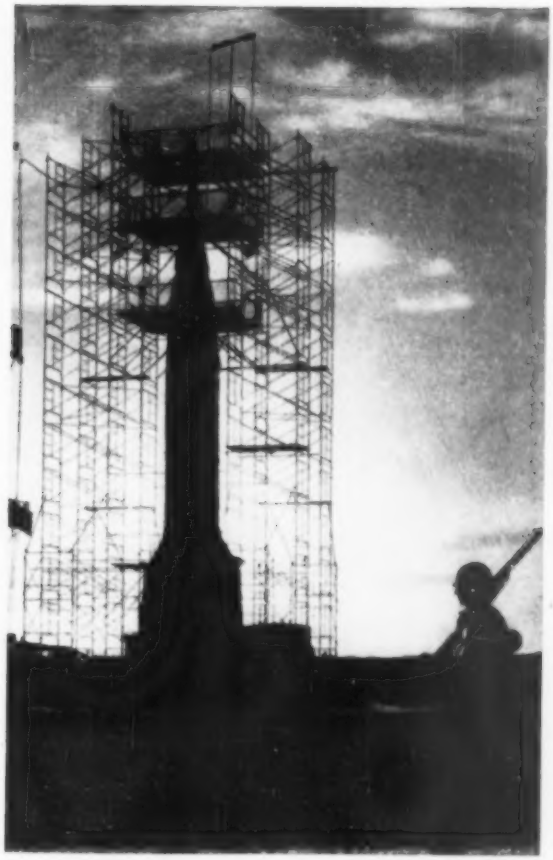
Destination:

Out of the realm of fantasy and into the world of scientific possibility moves man's age-old ambition to visit his neighbors in space.

By J. GORDON VAETH
U.S. Navy Special Devices Center
Office of Naval Research

SPACE



Dawn of the Space Age! A two-stage rocket, predecessor of multiple stage space ships of the future, ready for firing.

ESCAPE FROM THE EARTH—the greatest of all adventures—has become an inevitable engineering and aeromedical fact. Sounding rockets are reaching continually greater heights, and every improvement in their design, power plant, fuels, and performance takes us closer to space. Similarly, aviation medicine is resolving the problem of the human factor by eliminating the hazards which will confront space crews en route to and at their destinations. To arrive at such destinations has been one of man's greatest unfulfilled ambitions ever since he has known that other worlds exist. Such worlds are the frontiers of tomorrow. They hold the secrets of the Universe.

As the Earth's closest neighbor, the Moon will be the first of these other worlds to be visited. Exploration of the Moon will be followed by flight to the planets and, perhaps, by flight to the stars. A lunar trip will involve thousands of miles, interplanetary flight millions of miles, and interstellar flight trillions of miles.

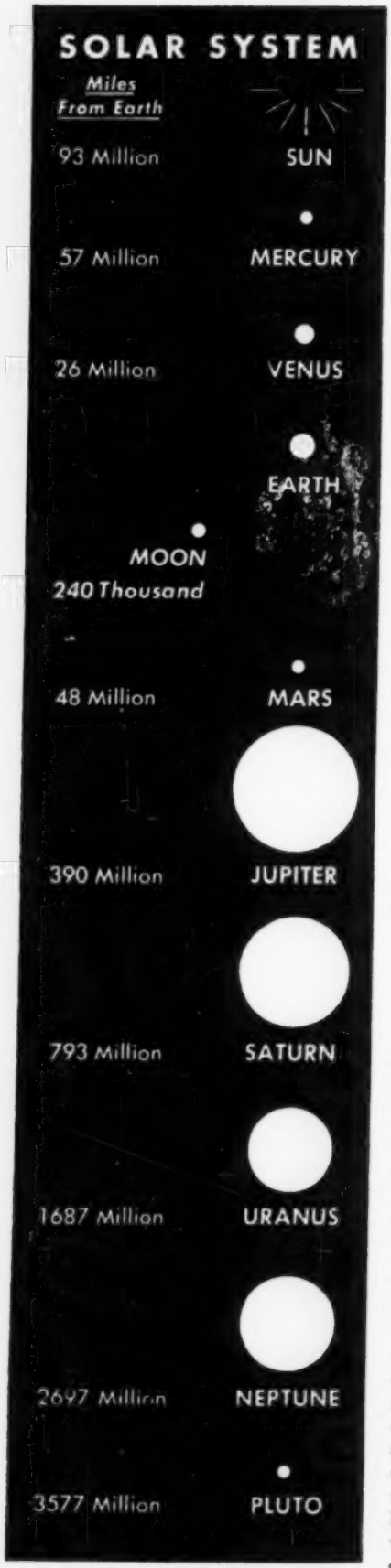
The first men to leave the Earth and travel the 240,000 miles to the Moon will find the Earth's satellite a barren and unfriendly place with a terrain of large open plains, giant craters, and steep mountains. On the Moon's surface, they will encounter temperatures the likes of which they will never have experienced on Earth, and they will perish if unprotected against these extremes of lunar heat and cold. Because of the Moon's lesser gravity, they will weigh only one-sixth their normal weight. They will find the horizon reduced to about two miles, a result of the smaller size of the Moon, which has a diameter of only 2,160 miles compared to the Earth's diameter of 7,920 miles. The lunar world will be a still and quiet one to these men; it has virtually no air or atmosphere to create wind or transmit sound. If they search for evidence of life, as they surely will, they may find primitive vegetation but nothing more. To the first explorers from Earth, the Moon will be a lonely, eerie, and perhaps terrifying world.

The Moon, man's first destination in space, seen in a Mt. Wilson and Palomar Observatories photo.

Probably the best known of all the Moon's geographical features are the craters or ringed plains which pit its face. Some of these craters are as much as 150 miles in diameter with walls a mile or more high. Their origin is not definitely established, being attributed by some astronomers to volcanic activity and by others to meteor impacts. The craters, as well as other facial features of the Moon, are probably covered with a mantle of dust either volcanic or meteoric in origin.

In addition to the craters, the Moon's surface has large

Private opinions and assertions of the author are contained in this article and are not to be construed as official or reflecting views of the Navy Dept. or naval establishment at large.



open areas or plains in which there are often deep cracks and fissures. The darker plains are called "seas" and derive their name from the early days of astronomy when they were mistakenly believed to be bodies of water.

Mountains on the Moon are steep and jagged. Their peaks rise comparatively higher, considering the respective sizes of the Moon and Earth, than any terrestrial mountains. They show no signs of being worn down or eroded away because water, air and wind, the elements of weathering and erosion, are lacking. The lunar mountains, therefore, basically retain the shapes and forms in which they were originally created.

Temperatures on the Moon's surface are severe. They vary as much as 490 or 500 degrees, reaching as high as the boiling point of water (212 degrees F) by day and sinking almost as low as 250 degrees below zero by night. These are clearly greater than can be tolerated by the human body. Some protection against these extremes of heat and cold might be obtained by tunneling a few feet beneath the Moon's surface where temperatures are more nearly constant and less extreme.

Because of its proximity to the Earth, the Moon is available for close examination and is consequently better known and understood than any other celestial body. Only 240,000 miles away, it affords the opportunity for detailed observation, photography, and even contact by radar. Nevertheless, it has many well kept secrets, particularly regarding its hidden face, its atmosphere, and its ability to support life.

Man sees only four-sevenths of the Moon, which moves in its orbit in such a way that it always keeps the same face turned towards the Earth. What exists on its unseen face is one of the Moon's secrets. It is doubtful, however, whether the first humans to view this hidden face will find it much different from the observed one.

Until recently, few astronomers would admit the possibility that the Moon has any atmosphere or possesses any form of life. Late observations have indicated that perhaps the Moon is not the completely dead and sterile world that it was so long believed to be. Meteor trails, caused by burning away of meteors by atmospheric friction, are believed to have been seen on the Moon. What are thought to be mists have also been observed around crater walls and floors. Meteor trails and mists would indicate the existence of some type of atmosphere, although undoubtedly a slight one. Additionally, what appears to be a low order of vegetation has been detected in some of the lunar craters. This vegetation, if that is what certain changeable dark markings prove to be, seems to flourish in the heat of the lunar day and die in the cold of the lunar night.

The Moon has long been regarded as a dead and unchanging world. It seems possible that first lunar explorers will find it quite different!

The Planets

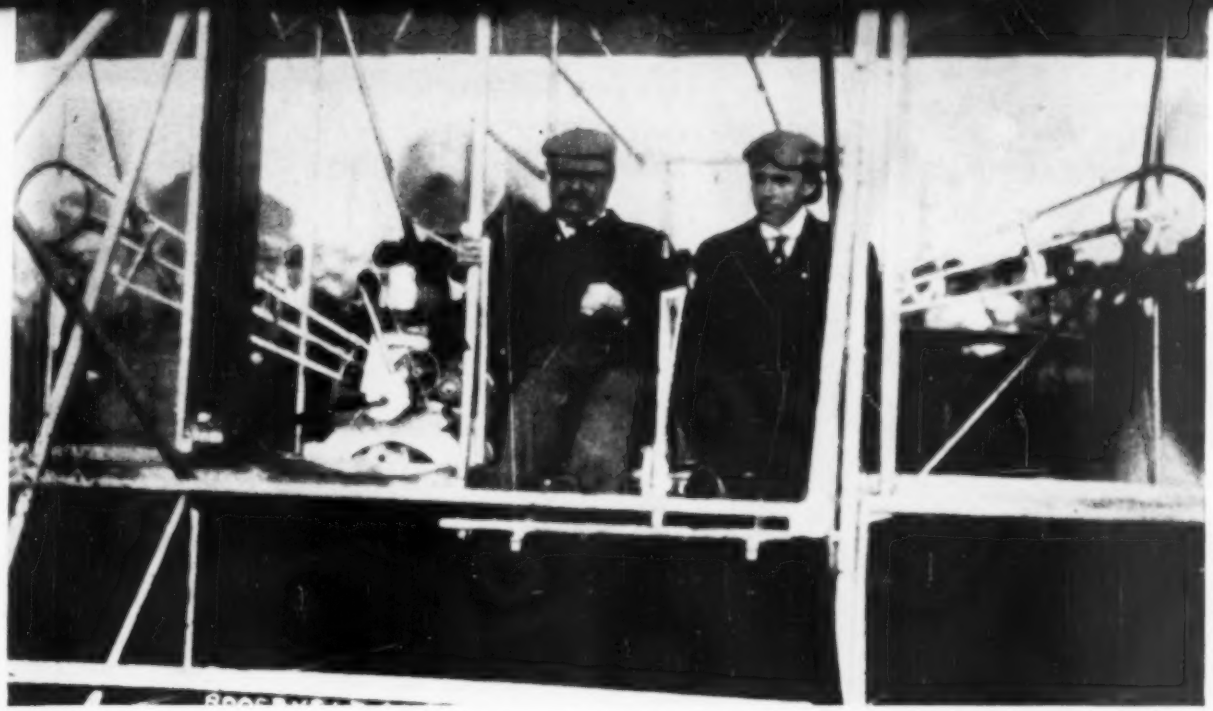
After the Moon, man will attempt to reach the planets. These worlds—the Earth is one of them—revolve counterclockwise in orbits around the Sun. Here is how these planetary members of the solar system are arranged:

Planet	*Average Distance from Sun (Millions of Miles)*
Mercury	36
Venus	67
Earth	93
Mars	141
Jupiter	480
Saturn	880
Uranus	1,780
Neptune	2,790
Pluto	3,670

Smallest is Mercury, which is less than half as wide as the Earth. Being the closest planet to the Sun, it is also the hottest. Temperatures on Mercury probably are as high as 700 degrees. The terrain of this sun-baked planet is believed similar to that of the Moon. Like the Moon, Mercury has little atmosphere, perhaps none at all.

Venus and Mars, because they are closest to the Earth, are well known. They are the likeliest planets, besides Earth, for the existence of life. Venus is comparable to the Earth in size and to some extent in temperature range, although, being closer to the Sun, it has an over-all higher temperature. It is the brightest of all the planets and can be seen in daylight. Little is known, however, about its terrain or geographical features which it keeps continually hidden by a dense cloud cover and atmosphere of carbon dioxide. Water vapor and oxygen have so far not been detected in this atmosphere. Until more is known about the Venusian surface, perhaps by radar mapping, no space ship will dare to attempt a landing on this planet.

Of all the planets, Mars has the greatest appeal to the popular imagination because of its reputation as a bearer of life. There is no evidence to support the belief that intelligent beings exist on this small red planet. Admittedly, Mars possesses an atmosphere, but this is mostly carbon dioxide; any oxygen that exists is insufficient to sustain animal life as man visualizes it. Temperatures are comparatively (*Continued on page 58*)



Clutching the fragile framework, Ex-President Theodore Roosevelt poses with Pilot Arch Hoxsey in a Wright biplane on October 11, 1910.

Teddy Roosevelt's Aeroplane Ride

Inspiration of the moment or political stratagem? In either case, it gave T.R. an aviation "first."

By WESLEY NEAL

ON OCTOBER 11, 1910, at Aviation Park (now Lambert Field), St. Louis, rough-riding "Teddy" Roosevelt became the first man who had been president of the United States to go up in an "aer-o-plane."

For several days, Kinloch Park crowds had thrilled to the sight of daredevil fliers paced by Arch Hoxsey, a crack pilot employed by the Wright brothers to boost the sale of flying machines. Arch set the stage for the St. Louis show and enhanced his fast-growing reputation as "King of the Air" when, three days before the Roosevelt episode, he flew the then fabulous distance of 85 miles from Springfield, Ill., to St. Louis. Enroute he circled the town of Staunton where he had been born 25 years before.

Hoxsey had just landed his skid-equipped Wright biplane in the middle of the field when he saw a mile-long string of automobiles turn onto the aerodrome from the St. Louis-Kinloch road. This was the high-speed entourage of the redoubtable T. R., who was in the midst of some western politickin'. Teddy's "square deal" was just getting under way and he was making a whirlwind personal appearance and speaking tour of St. Louis communities.

There is some speculation as to whether or not Teddy's aeroplane flight was premeditated. Considering the spontaneity of the proceedings, we are led to believe it was not. Knowing T. R.'s gift for the spectacular, however, we cannot overlook the possibility that he saw in the aeroplane ride a chance to elevate his national prospects, figuratively as well as literally. In any case, Hoxsey was a surprised aviator when the line of cars lurched past the field guards to come to a halt next to the waiting aeroplane. There, his mustache quivering above a wide grin, sat Roosevelt himself.

Although he had never met the ex-President, Hoxsey was already tingling with an idea. Roosevelt had humped out of the car and was on his way to the flying machine, his face beaming with boyish anticipation. Mutual friends introduced the two and when Roosevelt began picking his way among the wires and struts, Hoxsey said: "How about it, Colonel? Want to go for a ride?"

"By George," Roosevelt answered, "that's a great suggestion. Great! I heard about your trip down here from Springfield and I've been envying you. When do we go up?"

Hoxsey's reply was prompt. (*Continued on page* 48)

Million Dollar Idea

H. J. Burrows admits that his equipment is the finest, but perhaps he's unduly modest in understating his outstanding technical skill.

Elements of the million-dollar idea are all shown at the right—*Cub*, camera, cars, photographer, pilot and photogenic sales staff.

By H. J. BURROWS

A *Cub*, a camera and an idea zoomed the author into upper brackets. Like to follow suit? Here's how!

EVERYBODY who flies is a natural camera fan—his plane a grandstand seat for picture opportunity—yet the surface of the opportunity for commercial purposes has not yet been scratched. Promotions of photos on a nation-wide scale remain largely unexplored. Potentialities are enormous.

I've parlayed a *Cub*, a camera and an idea into a million dollar plan which year in and out provides me with everything I've wanted that money could buy. For the good and welfare of the order—here's how.

Back in the dark days of the depression I first put my plan in operation and after two weeks trial had taken in enough money to pay for the airplane, a $350 camera, and still had a profit of $770.

One week last winter in Miami my crew made 1,410 pictures from which 1,080 sales were made at an average of $16.40. Gross "take" that week was $17,388. Of this amount, 10 per cent went for sales commissions—an average of $590 each to three sales girls. Pilot's and photographer's pay took another five per cent; hotels, meals, plane and car maintenance an additional five.

The average cut for laboratory costs, film, mailing, bookkeeping and incidentals runs to 15 per cent of gross. I figure on 50 per cent profit to be on the safe side.

Of course this was one of the biggest weeks—girls working until after dark and photographer utilizing every hour of good light. I looked for the dependable old Continental "65" engine to give up but it too seemed to know what was going on. However

Every resident of the Virginia town above owns one of these photos. The local bank has a 30' by 40' mural reproduction on proud display.

Progress photos during construction are now a "must" for builders. Shown at right is the National Institute of Health, Bethesda, Md.

Cities aren't the only target. The country store picturesquely centered in the lower photo outdid itself in buying numerous copies.

these big weeks are no good, as usually the next week everyone is half dead, equipment in bad shape, and the take consequently below average. An ordinary week will run about 800 pictures and 600 sales and at that pace all goes smoothly. At such a gait the crew draws down from $300—$400 each and I continue "piling it up."

As to the plan itself.

First, one organizes an air photo and sales crew. The total cost of getting into operation, with adequate reserves for the first 30 days, should not exceed $3,000. Necessary gear consists of, mainly, an old Aeronca or *Cub* with a good engine which can be had for around $600. A good car suitable for constant use is needed as is a camera with a particularly good lens, along with heavy stocks of sundry gadgets and supplies.

Personnel (*Continued on page* 42)

Coyote Shooting in Alberta

Famed as a wildlife guardian, the airplane turns killer to destroy the savage, marauding coyote.

By JACK STARKY

AS A SEQUEL to the article "Wild Life From Aloft" in a recent issue of FLYING, I thought the experience of Donald McLaughlin and myself in coyote hunting might be of interest.

Don, an RCAF pilot of the late war, and the writer, who loves a shotgun, make a team which has eliminated more than 300 of the bird-killing coyote pests from our countryside. Nor will we deny that the job has its moments of excitement.

After trying several types of aircraft we found the *Cub* was best suited to our purpose. The best time to hunt is on a bright warm day with about a foot of snow covering the ground. Under these conditions the coyotes are easily spotted from 500 feet. Flying at this altitude, with one of us scanning the ground to the left and the other to the right, we cover a mile wide swath of observation. At first we were afraid of confusing farm dogs with coyotes but soon learned that a dog always runs toward your plane while a coyote always runs away from it.

Surprisingly enough, we have killed more than 100 coyotes within a 10-mile radius of the City of Edmonton with its 172,000 population and surrounding oil fields. It is not unusual to sight the beasts around the city limits.

Our hunting technique follows an invariable pattern. Upon sighting a coyote Don sizes up the best approach in view of various considerations, while I wire open the window of the *Cub*, load my Winchester repeater and get set for shooting. Dropping to about 50 feet above the ground we approach from behind the quarry so as not to cut him off and set him to dodging. Our percentage of kills is almost perfect and we usually get the game with the first shot.

I use a 12 gauge pump gun. The single barrel is easier to handle in the slipstream than is a double barreled gun, and you need multiple shots because the coyotes often run in pairs. In aiming I lead in reverse, for although the coyote runs from 38 to 40 mph, the speed of the plane is still greater. On straight-away shots the aiming point should be just behind the coyote and on angle shots—the most effective approach if the angle is not too great—just below his front feet.

Some coyote hunters claim frozen lake surfaces are the best shooting areas but Don and I find the open grain fields most prolific. On one occasion we got 30 kills in three hours of open field hunting. Hundreds of times we spot coyote tracks in the snow terminating where the beast pounces on the bird. On one occasion we shot just as the coyote pounced and saw the Hun fly away unharmed.

One afternoon over the prairie we spotted two coyotes. Since we frequently got "doubles" in one approach, we prepared to add to our record. To our surprise the beasts on this occasion took off in different directions just as I was about to fire. One darted back toward our plane and I knew I had to get him first if we were to record another "double." Leaning far out, with Don holding me by the belt, I shot at the coyote almost directly below us.

Immediately the plane set up a terrific vibration. I had shot a hole through the prop! Don cut the switch and put the *Cub* down safely in an open field near a farm house. With 60 combat missions over Germany, Don had to be shot down for the first time by his (*Continued on page* 62)

AIRWAY MANUAL

Jottings in a dime store notebook launched Elrey Jeppesen on his career as aviation's "information please."

By HAROLD H. PROMMEL

UPON A DAY in 1929 a young airmail pilot, by name Elrey B. Jeppesen, decided he should do something about the future of his own neck. Under similar circumstances you or I might have consulted an insurance agent. Jeppesen took more direct action. He walked into a dime store in Salt Lake City and bought a notebook.

At that time he was flying the Omaha-San Francisco route in planes which could not go above the weather around the peaks. At times, in common with his confreres, this seemed a matter of heavy sweat to each and all.

Some of the remedy, Jeppesen thought, lay in a notebook, which he began to fill with observations made as he logged his hours. The observations consisted of airport drawings, terrain characteristics, obstacles around various emergency strips and terminals, mileage figures—any dope which he felt might be helpful when the chips were down. In no time at all the book bulged with data on pilot lore covering the land and sky between the Missouri basin and the Golden Gate.

Eventually pilots from all parts of the country heard about Jeppesen's book and wrote him for copies of it. In return they offered him information on their routes, to be included in his book. "Jep" helped as many as he could but finally ran out of time to keep up with his labor of love. Whereupon he got another idea. "What the heck," he said to himself, "I'll get a batch of books printed and set me up a business."

Such was the humble beginning of *Airway Manual*, known today as the leading radio and instrument flight book in the business.

Mention *Airway Manual* and many people conjure up the picture of a government publication produced and distributed by the Civil Aeronautics Administration. This is about as far from fact as one could get. *Airway Manual* is and always has been a private venture produced by Jeppesen's own company, presently located in Denver, Colo.

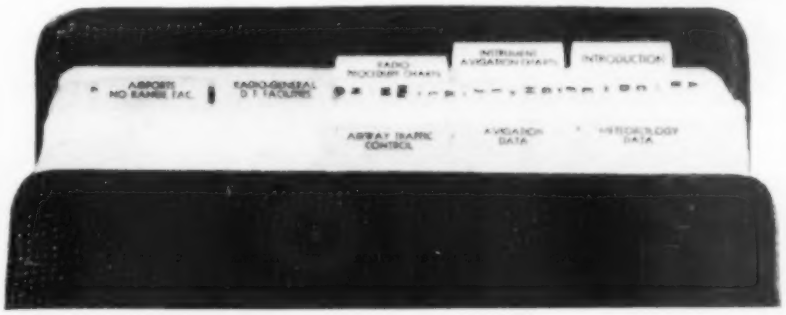
In physical make-up the *Manual* is a loose-leaf handbook whose 5½ x 8½ inch pages are contained in tough cowhide binders for heavy wear. In content the volume contains information on civil air regulations, air traffic control, weather, general radio data, en route flight and planning charts and drawings of the major airports throughout the United States. Additional binders carry approach and let-down procedure pages. Every airport with any kind of radio facility is also included in this section.

Each radio procedure page shows a drawing of the range system, as well as the airport itself, and accurately positions obstacles to safe flight—towers, power lines, bluffs and unusual hazards of any kind. In addition, each page includes accurate drawings of standard take-off, let-down and missed approach procedures for the airport under description. If a station has two or three different facilities—LF, ILS, OMNI—then there is a page in *Airway Manual* for each type of facility.

Once a pilot has selected the facility by which he will make his approach and let-down, he can slip out the reference page from his *Manual* and clip it to the panel or, if he prefers, work directly from the bulkier book. Individual *Manuals* are made up in sets of from one to three volumes, depending on the area covered. There are eleven different area combinations and a total coverage includes beside the United States, Canada, Alaska, the Aleutians, all major Pacific islands, Japan, eastern Mexico and the Caribbean. Eighteen large planning charts cover every airway in the States and Caribbean area with a myriad of smaller charts blanketing other points. Once each week—oftener if necessary—revised pages are sent to subscribers. Such pages incorporate all changes made in facilities.

Price of this library of air data ranges from $49 to $97, depending on the coverage required. Once *Airway Manual* is purchased, the only other cost is the yearly revision service. Although Jeppesen has a few dealers scattered around the country, most of the sales are handled by mail or personal contact. (*Continued on page* 46)

Elrey Jeppesen (right), a pilot since the age of 16, was an airmail pilot in 1929 when his "Airway Manual" idea was born. The index to the current Manual (below) indicates why pilots today find the publication invaluable.



Full use of slots and flaps is made by Designer S. Elibekyan in this side-by-side, two-seat primary trainer. The high wing monoplane, of metal and wood construction, is powered by a 90 hp radial and has nosewheel gear.

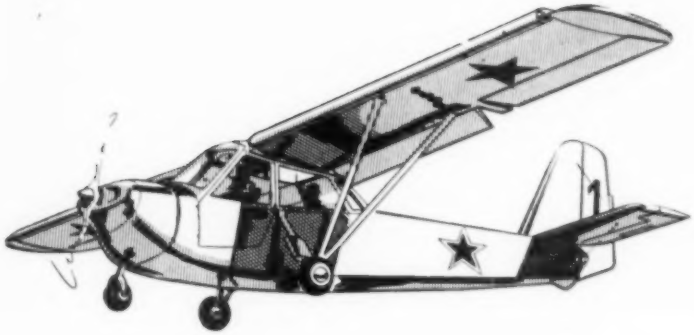
Russia's Air Youth Program

Powered flight, gliding, parachuting and aircraft design—Russian youth are indoctrinated for the Air Age through DOSAV.

FOR TWO DECADES Russia has been pushing ahead with a vast aviation popularization program aimed at selling flying and fostering aviation-mindedness in the remotest Soviet village as well as amassing a tremendous reserve of trained flying personnel as the backbone of Soviet air power.

In the hands of DOSAV (*Dobrovolnoie Obstshyestvo Ssodyeistviva Aviazya SSR*, or "All-Union Society of Voluntary Assistance to Aviation," this program long ago exceeded in proportions anything on similar lines envisaged elsewhere in the world. Headed by Lieutenant-General of Aviation Kamanin, Hero of the Soviet Union, DOSAV embraces every form of aviation interest, from powered flying, rotor and fixed wing gliding and parachuting, down to model airplane building. The unlimited value of this huge organization to Soviet air-power can be seen when it is realized that from this semi-trained pool of personnel the Soviet Air Force draws a continual stream of recruits to man the numerous new combat formations estab-

Vladimir Gribovskii, known as a glider specialist, turns his talents to a low wing tourer-trainer. The 90 hp radial is believed to be a version of Arkadii Shvetsov's M-11. The nosewheel gear is of the levered-suspension variety.



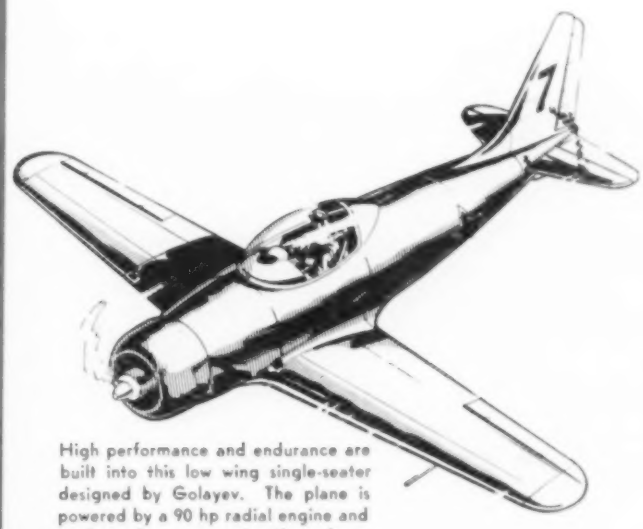
Designed for assembly from kits supplied by DOSAV is this high wing, single-seater trainer/tourer by V. Nikitin. The ultra light little plane, with a 50 hp "flat" engine, has fixed nosewheel gear and fixed leading-edge slots.

By WILLIAM GREEN

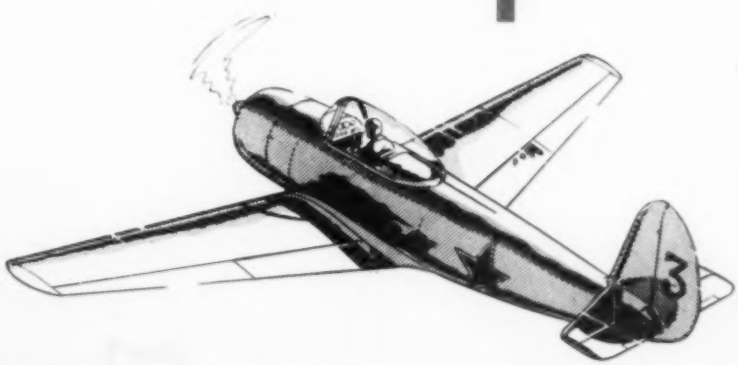
lished under the current expansion program.

DOSAV'S influence on Soviet aviation is not restricted to the training of future Air Force personnel; it is frequently from the airplane design competitions that it promotes that budding young Soviet airplane designers first come to light. The equipment of the majority of the many hundreds of DOSAV flying schools scattered throughout the Soviet Union is at present limited to Polikarpov's 1927 vintage PO-2 biplane and Yakovlev's UT-2 monoplane of 1935 design. With a view to providing suitable replacements for these venerable old-stagers, DOSAV organized an open competition for the design of training and sporting airplanes suitable for mass production for the re-equipment of the "civil" flying schools.

First promoted in 1950, prizes ranged from 10,000 to 40,000 rubles ($2,500 to $10,000). The competition, open to individual participants as well as design groups, was arranged in three elimination stages: (1) the submission of designs in general layout form; (2) the detailed design of selected projects, and (3) the prototype construction of (*Continued on page* 48)



High performance and endurance are built into this low wing single-seater designed by Golayev. The plane is powered by a 90 hp radial engine and is of wooden construction throughout.



Ollo and Shprangiel, new Russian design team, are credited with this speedy, single place advanced trainer. With a 225 hp radial and top speed of 198 mph, this monoplane is of metal and fabric with retractable tail gear.

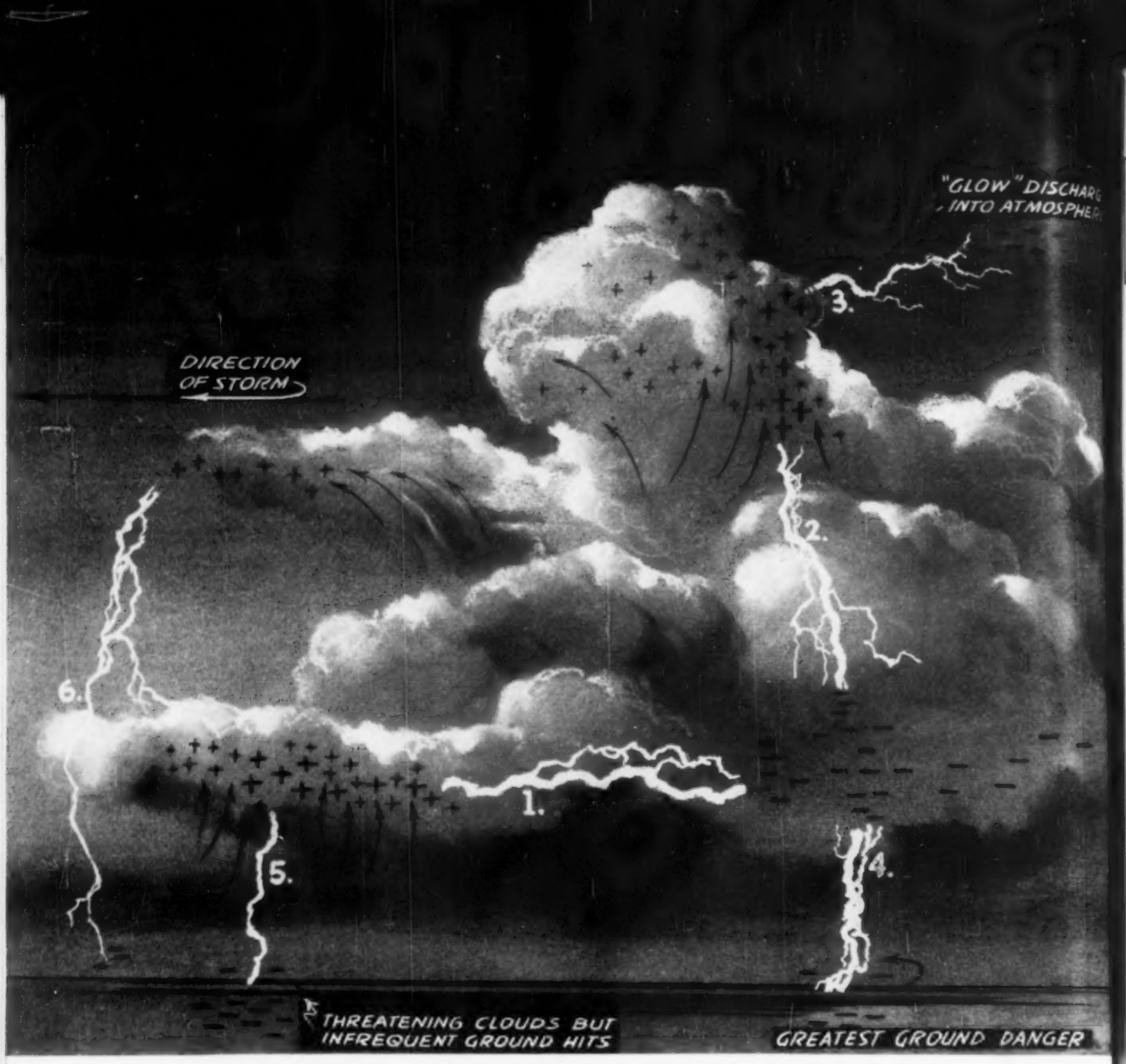
ARMCHAIR

Above, gear is unloaded from the helicopter on a convenient snowfield. Weather is watched with extreme care, for clouds up here can form rapidly and then it's a race to get the surveying party out in time. Right, the surveyor pinpoints his aerial photos to position the spot of theodolite sighting. On the back of the photo, pinprick will be circled and data recorded. When photo is held to the light, pinpoints are readily seen. Below, while one surveyor uses the theodolite the second records the readings. The scene is Mt. Ruth and the snowy landing patch is 30 ft. below.

By RICHARD HARTT

SURVEYING

THEY CALL IT "armchair surveying"—the U. S. Geological Survey's ultra-modern method of charting some of the nation's most rugged terrain. The Picket Range in the Mt. Baker area of Washington State is typical rough, roadless country ideally suited to survey by helicopter. The temporary camps, back-packed food, bedrolls and camping gear formerly required for such a project are a thing of the past. Today's surveyors carry their charts, theodolites, a few sandwiches and a handie-talkie radio. The helicopters also carry handie-talkies and the party radio frequency is guarded at the home base. A single helicopter sometimes serves as many as three surveying parties simultaneously. Nature, which makes ordinary surface surveying well-nigh impossible in many mountainous areas, cooperates in lending efficiency to the helicopter operation. Just where the cliffs are loftiest and most unscalable, nature is apt to furnish a patch of snow that provides the perfect set-down spot for a helicopter. Until you look down the sheer side of one of those cliffs, it's hard to believe how rough a climb can be. END



This is how lightning discharges. Numbers indicate the relative frequency.

HAVE YOU EVER wondered why lightning is represented by a jagged, back-and-forth sort of line? Actually a lightning bolt looks nothing like that. I have an idea that the primitive eye caught something that we today cannot see—the fact that lightning goes two ways.

I have seen designs on ancient Zuni blankets and pottery depicting thunderclouds done as accurately as an expert meteorologist would do today. Primitive accounts talk of an "exchange of fire" between the cloud and earth. That is a fine scientific description; as the strip at right shows, the first lightning bolt makes contact to empty the cloud's overload while further strokes go back and forth until the electrical potentials are completely equalized.

That "pilot streamer" might interest you, for few people know that a cloud sends down an invisible feeler called a "leader," that weaves around in search of an object to strike. A very tall object may send up its own leader and in many cases the object strikes the cloud instead of being struck! In 52 strokes to the Empire State Building, it was found that only two were initiated by downward leaders.

This "believe it or not" type of information might seem to have little value, but knowing more about the anatomy of anything lessens the fear of it. And the most dangerous thing about lightning is often just fear of it. Formerly many plane passengers were amazed to find themselves whole after having been struck by lightning while flying through bad weather. Now the fear of lightning during flight is much less because we have been taught how a closed metal device like a car or an airplane fuselage becomes a Faraday-cage, immune to lightning.

During the war, overseas flyers were introduced to St. Elmo's Lights which were then both frightening and mysterious. If you don't already know what they are like, look at the upper chart on page 52. This discharge type of lightning is caused directly by the plane itself and many reports of having been hit by a bolt actually refer to St. Elmo's Light; in these instances,

WEATHER WISDOM III

LIGHTNING

This is the third of a "Weather Wisdom" series suggested by the manuscript of *Eric Sloane's Weather Book*, to be published shortly by Duell, Sloan and Pearce—Little Brown.

By ERIC SLOANE

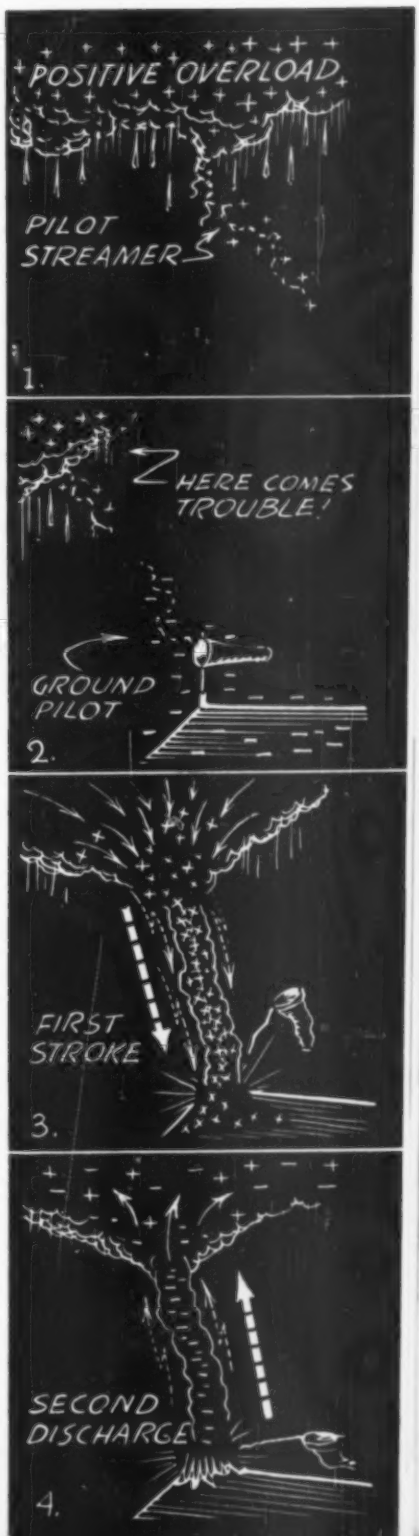
it is actually the plane that strikes the cloud!

Wherever there are fast updrafts you will find an abundance of positive electrical charges aloft; the whole upper part of a thunderhead may be alive with it. When a plane flies through many overloaded clouds, it will pick up much of their overload and become a potential thundercloud or "thunderplane" itself.

When your radio begins to be useless because of the sizzling and crackling of such an overload, you may look toward the wings and all protruding masts or even the propeller tips for the bright flames of St. Elmo's Lights. When that occurs, the rule is to put on your dark glasses and get ready for the flash when you fly near enough to a cloud that will accept your overload by means of a real lightning bolt. It's a scary thing, but as harmless as a Fourth of July firecracker.

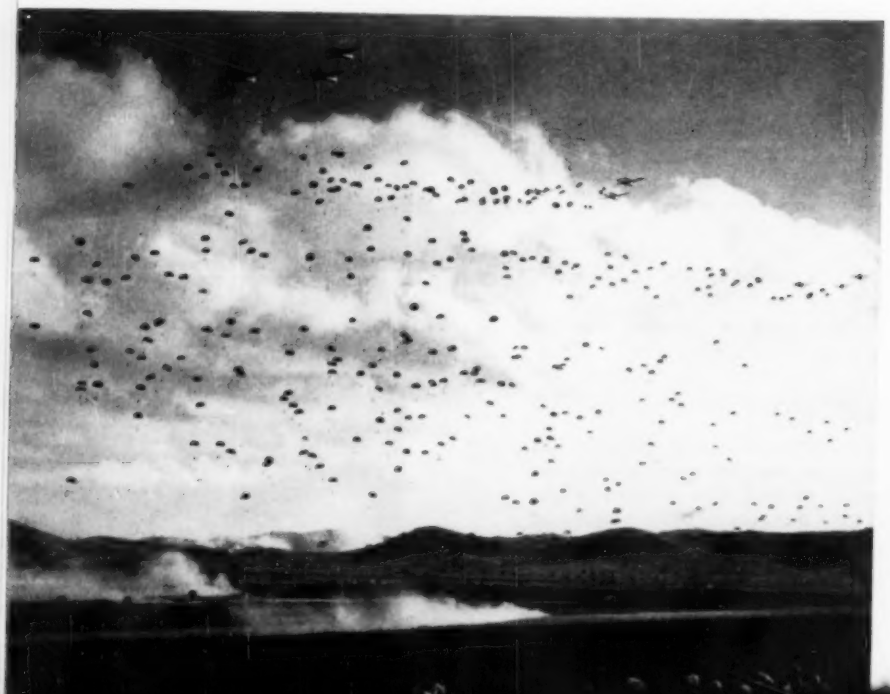
The large drawing on page 22 portrays an average thunderhead with the various kinds of discharges possible, numbered according to their average occurrences. Notice that the uprush of air pushes the positive charge aloft while the falling rain concentrates a negative charge along the cloud base.

The currents within a thunderhead are so gusty that the raindrops are repeatedly broken into smaller drops. Each time this occurs, the negative and positive electricity will be separated, the air taking up the negative current and the rain- (*Continued on page 52*)



Andre Jacques Garnerin's historic descent over London is pictured in this contemporary print. The smaller balloon at top was the pilot balloon sent up to test wind. Garnerin himself, complete with cockade and tricolor, is shown below.

More than 1,000 paratroopers, dropped by Fairchild C-82 *Packets*, participate in a mass descent over the Island of Vieques, Puerto Rico, in joint Army, Navy and Air Force exercises.



Parachute Pi

S T. GEORGE'S Parade, London, was jammed that afternoon, September 21, 1802, as holiday-minded crowds gathered to watch a 33-year-old Frenchman prepare for a strange and dangerous exploit. Andre Jacques Garnerin was going to rise high in the air in a basket suspended from a huge balloon, then cut himself adrift. His chest-high basket would be attached by cords to nothing more substantial than a flimsy canopy of

Today's ribbon parachute cushions the shock to pilots bailing out of high speed planes.

Parachutes laden with men and equipment fill the sky at Fort Bragg, N. C. (left); the "mock tower" above is an Air Force training device.

ePioneers

So you think the Air Age began at Kitty Hawk! Aeronaut Andre Garnerin was famous 100 years before the Wright Brothers.

By ABRAHAM STERN

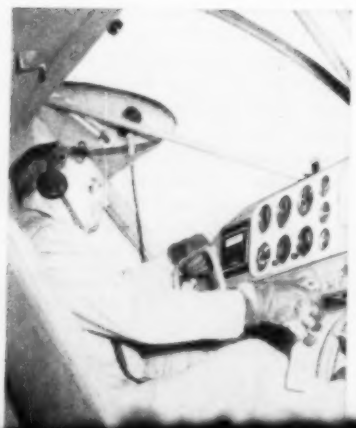
cotton cloth. This new-fangled contraption was called a parachute.

Suspended from the inflated balloon by a stout cord, it hung on a ribbed framework like a huge half-closed umbrella. When the balloon ascended it would draw up the parachute and basket under it. At the proper altitude the parachutist would cut the retaining cord, and perhaps mumble a prayer. Air trapped in the canopy of the parachute would slow the rate of descent—if all went according to plan.

Amid a tense silence the daredevil Frenchman dramatically swept his hand down in the signal to cast off. The cords holding the balloon fast were released. The balloon rose, its death-defying occupant patriotically waving the tricolor of France. A dizzy mile and a half into the air climbed Garnerin. High enough. Overboard went the tricolor, the signal that he was about to descend. Taking his knife, the gallant Frenchman slashed the cord. Rapidly the basket plummeted down but the air caught the folds of the parachute and checked the fall. "My calculations were correct," later wrote the intrepid Andre Jacques, "and my mind remained calm and serene."

Having no vent at the top to allow the trapped air to escape, the parachute began to sway from side to side. Gathering momentum, the oscillations increased until at times the basket was almost in a direct horizontal line with the canopy. The spectators below gaped at the swinging basket, half expecting to see Garnerin tossed out. But the experienced aeronaut jettisoned ballast and reached the ground safely. He landed in a field "halfway between the Small Pox Hospital and St. Pancras Church," (*Continued on page 59*)

The Alaskan village above, with snow piling up to roof level, is typical of the communities on Doc McKinley's aerial route. Snow drifts up against the skis of Doc's Aeronca (left) to provide a rather effective natural tiedown.



Doc McKinley was late for the 90's rush, but he found gold in them thar fillings.

By JAMES JOSEPH

Wresting the ski from the frozen ice (far left) is a routine flight preliminary. At left, Doc sits at the controls of his Aeronca Sedan, ready for take-off. In six years he's logged more than 2,000 hours making the rounds of his aerial beat.

Doc McKinley and his assistant, also a licensed pilot, hoist the tail of their flying advertisement and point the ship windward.

Sometimes Doc's patients reach the airport via dog-sled (above). Top photo shows lineup of lightplanes at Merrill Field, Anchorage.

Alaska's Cross-Country Dentist

A WIDE-EYED Aleut Indian kid burst into the squat log house and announced excitedly, "The airplane dentist, he come!" In his eagerness to get the words out he ran rough-shod over the grammar so patiently taught at the government's local Native Service school. The child's mother smiled. She slipped into her caribou parka, crunched across the hard-packed snow and presently emerged from the family's stilt-supported cache.

"Here," she said, handing the boy a couple of big, dried salmon, "go have that tooth pulled."

Indian youngsters and their parents who live in the little Alaskan town of Dillingham on Nushagak Bay, an arm of the Bering sea, have long been accustomed to airplanes. Roadless and isolated, Dillingham looks to dogsleds, to an occasional summertime boat and to the airplane for transportation "outside." But the dentist's plane—ah, that is special!

Today, as always, Dr. Lee L. McKinley banked low over the village. His Aeronca *Sedan's* skis shimmered in the hard arctic light. The cold glare bill-boarded "D-E-N-T-I-S-T" spelled out in big letters on the ship's sides. "Doc" McKinley wasn't one to keep his arrival a secret. He wanted his patients ready when he set down on the snowy strip.

Doc wasn't disappointed. He hadn't switched off the engine before patients and well-wishers were swarming around. You'd have thought he was delivering a bonus instead of arriving to yank out molars. This was a routine welcome for Doc, for in out-of-the-way Alaskan villages the dentist, the doctor and Santa Claus rate equally in public favor. Doc unlimbered himself from behind the controls. Somebody hoisted his portable dental chair out of the ship; someone else shouldered his dental tools. Soon he was established in a hotel room, filling, pulling and polishing.

All of Doc McKinley's patients don't settle their accounts in salmon, for the man who has become known as "Alaska's cross-country dentist" owns a brace of shiny Cadillacs, a plush suite of offices in Anchorage, and commutes twice daily from his 160-acre Matanuska valley farmstead to Anchorage and back. It's 48 air miles and about 20 minutes by Aeronca from his farm's 1,200-foot, east-west landing strip to Anchorage's Merrill Field, where Doc ties down. "And a lot cheaper than driving the Cad," says Doc.

While he admits that salmon won't keep him airborne for long, there have been numerous occasions when he bartered dental services for such durable goods as moose meat and fat trout. In Doc's fee book an extraction is worth (*Continued on page* 45)

Plastic horses, three from a herd of 250 flown from Cleveland to Chicago, will serve as coin-operated steeds for junior grade cowpokes.

Mechanical aids such as this fork lift add speed and efficiency to air freight handling.

VIRTUALLY non-existent a decade ago, commercial air freight in the United States today is a booming industry.

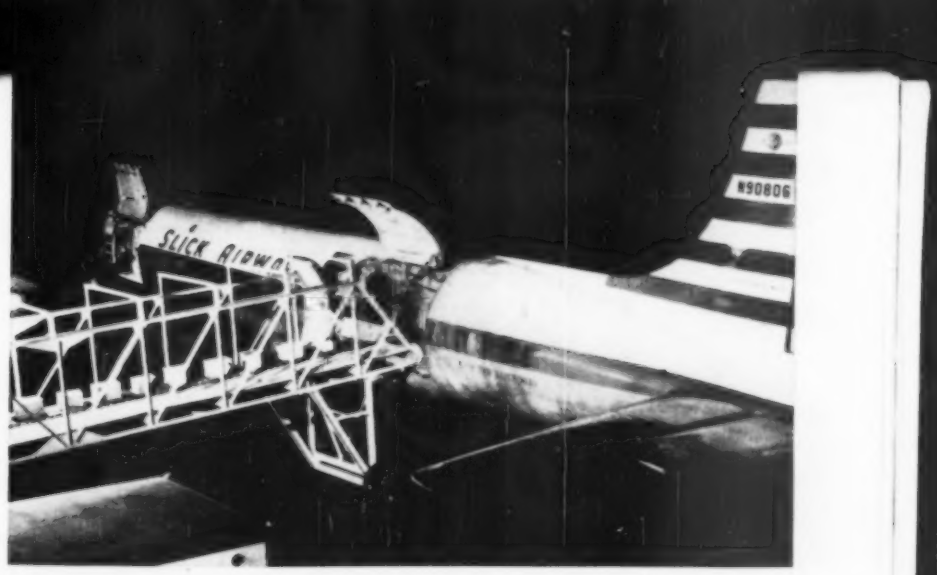
A quick look at the statistics proves that domestic air freight, now solidly on its own feet and swinging effectively in a hundred different directions for new customers in untapped fields, is no longer a stepchild to the passenger trade. Last year, 235 million ton miles of air freight were flown within the United States by certificated carriers. Many other millions were flown by non-scheduled lines. These figures are in impressive comparison with less than two million ton miles of domestic air freight flown in 1945.

What's more, say the experts, the surface has hardly been scratched. Lockheed Aircraft Corp., in a study on air freight growth over the next few years, predicts that by 1955 volume may rise to three billion ton miles a

Domestic Air Freight

Air cargo, postwar prodigy of commercial aviation, competes in old markets and opens new ones.

By JAMES H. WINCHESTER



The automatic loading ramp, especially designed for the all-cargo DC-6A, halves loading time.

From baby chicks to racing cars—any type of cargo is now "routine" along the airlanes.

year. Even that volume would be only a fraction of the potential business available—less than one per cent of all freight yearly in this country.

Leading the U. S. air freight parade are the money-making, CAB-certificated all-freight carriers, Slick Airways and The Flying Tiger Line, both with headquarters at Burbank, Calif. These two lines between them serve 76 cities. With a combined fleet of 60 two- and four-engine planes—including Slick's three DC-6A's, which carry 28,300 pounds of cargo each—they hauled 53 per cent of all ton-miles of air freight flown within this country last year.

Spurred by the success of the all-freight operators, the scheduled passenger airlines have also branched out in the air freight field. United Airlines operates 12 DC-4 *Cargoliners* exclusively for air mail, express and freight—no passengers allowed.

Last year, United hauled 22,725,000 ton miles of air freight, exclusive of mail and express. For the same period, TWA flew an estimated 25,000,000 ton miles of air freight, while American Airlines hauled 37,194,025 ton miles. In 1951, the domestic air freight carriers flew three times as many ton miles in one week as were flown during all of 1945.

Keeping pace with the astronomical tonnage figures being compiled by the air freighters is the increasing number of industries now shipping goods from one U. S. city to another by air.

Back in 1946, when Slick Airways, founded by a group of enterprising World War II Air Transport Command fliers, began operations, their first cargo was flowers and magazines. During their first year of operation, clothing shipments accounted for 85 per cent of their business.

The latest 12-month breakdown by Slick shows their air freight shipments, in terms of gross revenue, spread out like this: auto parts, 18 per cent; clothing, 17 per cent; electrical products, 14 per cent; flowers, 7 per cent; drugs, 6 per cent; machinery, 5 per cent; printed matter, 4 per cent; aircraft parts, 3 per cent; nursery stock, 2 per cent.

To sell air freight to new shippers, Slick freight analysts go into the field and show industrial traffic managers where—because of lower crating, insurance and inventory costs—shipping by air is actually cheaper than sending goods by train or truck. A typical study was made by Slick for Reid Brothers Co. of Beverly, Mass., manufacturers of heavy precision machinery. The result is that Reid's precision lathes, weighing 5,380 pounds, are now being shipped with crating from Boston to Chicago on Slick planes at a cost of only $336.25. The same lathe, crated, costs $393.35 to ship by surface transportation between the same points.

Speaking before the First Annual Seminar of the American Society of Traffic and (*Continued on page* 52)

IT AIN'T NECESSARILY SO

A *modus operandi* for the private flyer heading for a busy terminal is mapped by a veteran air traffic control operator.

By ARTHUR GORDON

At bustling Washington National Airport, where hundreds of airliners land and take off daily, the welcome mat is always out for private aircraft, properly equipped and handled.

NON-PROFESSIONAL pilots generally believe that light airplanes and private airmen are not welcome at large "control" airports. They feel a conspiracy exists among airlines, airport management and tower controllers to discourage use of these public facilities by the personal pilot in the smaller ship.

Obviously there must be some foundation for such a belief, and it is conceded at the start that there are airports where this condition does exist.

But in a broader sense, "it ain't necessarily so." Provided certain minimum requirements imposed in the public interest for safety reasons are met, there are few large airports where the business and revenue represented by the personal pilot are not most welcome.

It is significant that the impression of unfriendliness is generally not shared by the "professional" pilots of light aircraft employed in air taxi and charter service.

This, of course, is the tip-off. If these airports are used often enough, the pilot, the management and the controllers become "adjusted" to each other. This may be a cure in a class with the technique of learning to swim by being tossed out of a boat in midstream. Many a non-professional pilot decides after the first lesson that it isn't worth the effort, and retires to become another spreader of ill-tidings.

Few situations are better calculated to raise the hair on the back of your neck than to find yourself on a long runway in a little plane as a DC-6, with 10,000 hp screaming in low pitch, passes 10 feet over your head on a "go-around" because you were still there.

In this and many like situations, there is room for discussion of the respective responsibilities of the private pilot, the controller and the airline pilot. No purpose would be served except to point out that all three could be at fault.

How can we eliminate such situations and thereby gain increased use of the taxpayer's property for the individual taxpayer flying his own or his company's airplane?

In the field of air traffic, it usually holds that safety is synonymous with efficiency. The pilot who knows how to adjust his performance to particular circumstances invariably accomplishes most with greatest safety.

Use of Radio

Whenever a pilot has a reasonable minimum of adequate radio equipment, and the know-how to handle it efficiently, half the airport problem disappears. Yet it is not unusual to find a suburban pilot, who wouldn't drive his car downtown in a big city, quite eager to fly his lightplane with poor radio equipment into busy terminal airports like LaGuardia, Washington or Chicago.

Most of these fields require a *functioning* two-way radio, and charge a landing fee to discourage indiscriminate building up of traffic by pilots who are not equipped or trained to handle heavy traffic situations, including machine-gun-rapid radio instructions.

There are good arguments on both sides on the questions of landing fees at public airports, rights of personal contact with weather and flight advisory services, etc. The important point here is that no pilot should risk his or anyone else's neck by making a heavy traffic terminal his destination without meeting the minimum requirements.

Many pilots with good equipment get "mike fright," sometimes because of the supposed requirement of "recommended phraseologies." Then there is the individual pilot who has his phraseologies down pat—right out of Captain Video or Space Cadet. If such pilots realized the ludicrous effect of this Hollywood-style phraseology, they would more readily appreciate the simple, easily understood kind of "mike chatter" that gets the point over, is most "readable," and most breath-saving.

It was Delos Rentzel, onetime head of CAB, who suggested that pilots unable to master easily the recommended phraseologies should simply resort to ordinary English and say what they had to say.

Equally important is the ability to locate and tune the right frequencies. Nothing is more exasperating and radio-

jamming than the practice of the pilot assuming the transmitting frequency of the tower he wants a reply from and then repeatedly calling, until every station and tower in the area stops all radio traffic and calls him on all frequencies in the hope of snaring him and clearing the air.

Wherever there is more than one control airport in a metropolitan area, it is certain that 278 kc will not be the only tower low frequency in use. Yet every tower on other than 278 kc has to contend with the pilot who blissfully sails into the traffic pattern in the above manner, then indignantly demands to know who changed the frequency on him.

Check your charts as you approach the area and tune your receiver as accurately as you can in advance. If the tower is currently busy, you will pick up in advance the active runway, the wind and altimeter information and, very important, the traffic picture into which you will shortly be expected to take your proper place in sequence. And all this at leisure.

Then, if within the reliable range of your transmitter, make your initial call. If you have not previously heard the tower, but background noise and other signals indicate that your receiver is okay, include in your first call a request for a tuning count and the frequency on which you wish to reply. If still no response, and other conditions are adequate, continue your approach to the airport vicinity and repeat your attempted call at reasonable intervals. Watch for a light signal indicating that you are being received, but that you are not receiving the tower.

Inspect the field and traffic pattern for active runway indications. If two-way contact is not established, you will obtain traffic instructions by light signal. Meanwhile, keep an eye out for other traffic that may be ahead of you and always allow for the fact that larger aircraft normally make longer, wider approaches.

Or, you may hear the tower, properly identified, but still be unable to obtain a response to your call. A most likely conclusion is that your transmitter is not getting through to the tower for some reason, despite other traffic obviously flowing normally. Check the position of your transmitter selector switch. It is not unusual that a pilot calls on the VHF range-calling frequency, and listens on tower. Considerable telephone liaison is needed to get matters straightened out.

Alternate Advisable

If genuine "radio failure" has occurred, and a "satellite" or local no-radio field is available and usable, good judgment suggests that the pilot land there as an alternate. Often a pre-arranged, no-radio (*Continued on page 54*)

I Learned About Flying From That! No. 152

By ROBERT W. HAWTHORN

SINCE I BEGAN flying, I have logged 230 hours and acquired a commercial license. I thought I had learned quite a lot about flying.

Nearly all of this time was in my J-3 *Cub* which I keep on an Iowa farm. My landing field is a north-south strip of cow pasture. It's a hill-top about 600 feet long and none too smooth, but I am proud of the way the little *Cub* would "get on and off." It was during the Missouri River flood in the spring of 1952 that I learned my costly lesson about flying.

One mid-afternoon I received a phone call from a man who said his cattle were stranded in rising flood water. Would I fly him to his farm and land on a road? Then he could turn his livestock onto higher ground and give them feed. I said I wouldn't know until I flew over the place if it would be safe to land there, but we could fly over right away and look at it.

I flew to the Mapleton, Iowa, airport five miles north of my field and picked up my passenger. His farm was about 20 miles straight west of the airport between the two flood-stricken towns of Sloan and Whiting. The ceiling and visibility were unlimited and we could see a lot of flood water all over the Missouri River valley in both Iowa and Nebraska.

My passenger directed me to his farm, where we could look down on his five milk cows, four calves, two horses and a few pigs, all standing in water which apparently was getting deeper. His buildings and a little land around them formed an island, completely surrounded by rushing flood water. He had left home with his family before the water came but didn't have time to get his livestock out.

The road he had thought I could land on was high and dry but not very wide and only a quarter mile long. It had a power line on one side, a telephone line on the other, and tall trees at both ends! I didn't hesitate to announce that I would not land there for anything. There was a field south of the road that was wide enough and probably long enough, with trees at only the west end. Although the ground was dry, it was a plowed field which looked rough and possibly soft. I did not want to risk a landing there, especially with a passenger, if we could reach the livestock any other way.

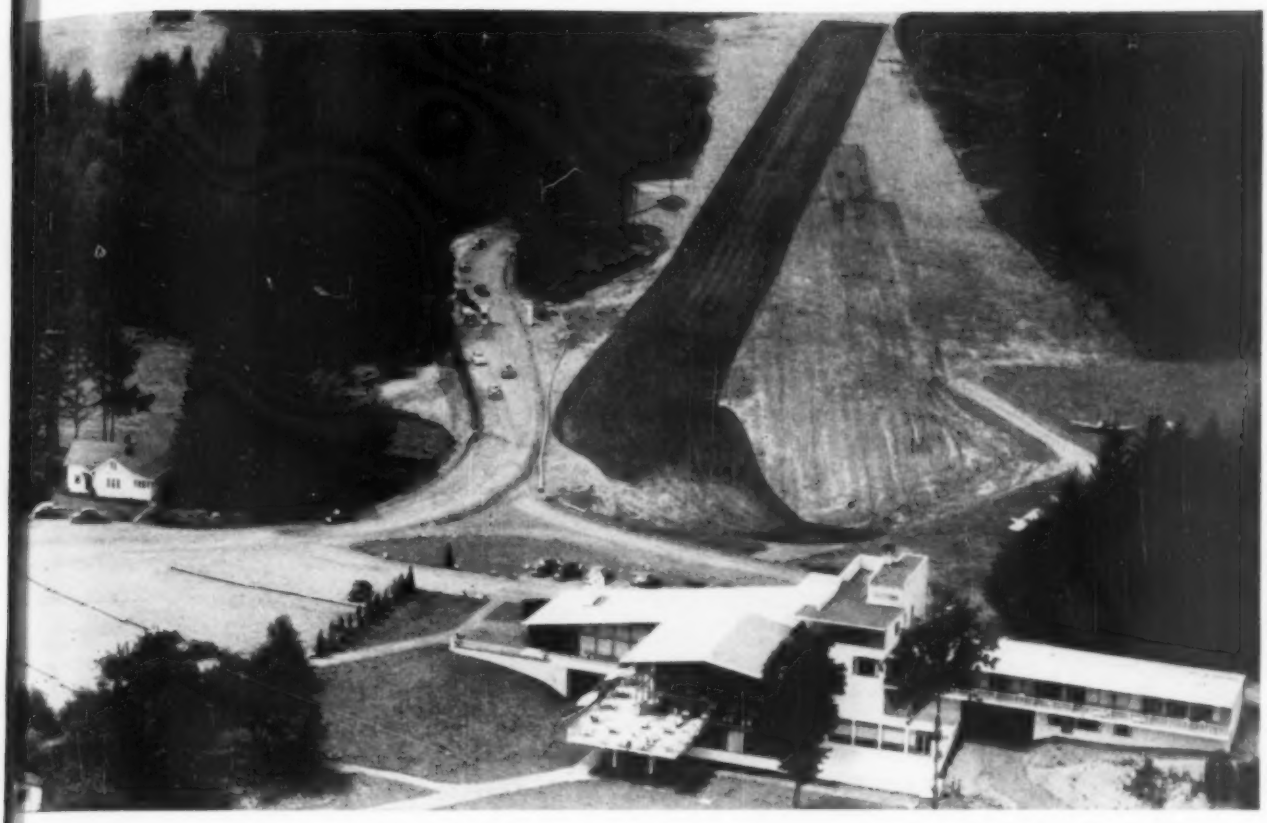
I then spotted an inviting hay field on dry land a half mile north of the livestock. My passenger had hip boots in the baggage compartment of the *Cub* and we thought he could wade across the field for the rescue. I made one pass at the field and it looked OK so I made another approach for landing. We came to a stop about in the middle of this nice, smooth field.

Then my passenger had an idea. A "Cat" tractor was parked on high ground near the plane and he decided to drive it through the water instead of wading. Before he had gone far, the water was above the tracks on the tractor and into the fan. The currents were so swift that he was afraid of driving into a washed-out hole where he would be stuck for good. He also gave up the idea of wading because it would be just like trying to wade a swift river. He managed to head the tractor around and return to the plane.

My passenger now begged me to fly him into the plowed field near his cattle. There was not a boat available and the plane was the only way to save the livestock. I still did not want to risk a landing into that miserably small, rough field with a passenger, especially one weighing over 200 pounds. I weigh only 130 and there is a surprising improvement in the short field performance of my *Cub* when I fly solo. I told him I would attempt a landing there alone. If I got in, I would take care of the livestock.

It was nearly sundown when I started the *Cub* (*Continued on page* 62)

Unharmed, but "mighty disgusted," Robert Hawthorn poses beside the *Cub* that was wrecked when he let the pleas of a neighbor in distress overrule his own good judgment in an emergency.



The 2,400-foot airstrip, adjacent to a luxurious $300,000 lodge, is one of the reasons why Washingtonians enjoy their lightplane flying. The Seattle architectural firm of Young and Richardson, Carleton and Detlie, designers of the lodge, recently won the grand honor award of the American Institute of Architects. In the citation the A.I.A. described the Lake Wilderness lodge as one of the three "most exceptional" buildings designed in the United States during the past four years.

Gaffney's Lake Wilderness

This "wilderness" is within easy reach for week end vacationers whose highway is the sky.

By IRVING PETITE

GAFFNEY'S LAKE Wilderness, a resort on one of Western Washington's scenic and still largely natural lakes, recently completed construction of a 2,400-foot airstrip for the convenience of its increasing number of airborne patrons.

The private strip adjoins a modernistic $300,000 lodge which is supplemented by 70 family-style cottages and sprawling picnic grounds to accommodate 9,000 persons.

Located in the foothills of the Cascades, some considerable distance by highway from Puget Sound cities, Gaffney's is just a few minutes flying time from Seattle's Boeing Field or the Seattle-Tacoma International Airport at Bow Lake.

Air taxi service to Gaffney's is available by calling the Bellevue Air Field. They will pick up passengers at either of the large airports and fly them into the resort. Rates charged by these insured carriers are: one person, $10; two persons, $15, and three persons $18.85, with the tax additional in each case. The maximum load is 550 pounds and service is between sunrise and sunset.

Gaffney's does not sell gas, since they are just 12 minutes by air from the several gas facilities at Renton Municipal Airport to the west. END

The Percival P.56 *Provost*, basic trainer of the RAF, is an all-weather plane powered by a 550-hp Alvis Leonides Mark 25 radial engine. Top speed is 200 mph.

THE PERCIVAL PROVOST

To fill the need for a versatile trainer, designed for early weeding out of inept students, the RAF has settled on the Provost.

BETTER PILOTS and a big reduction in pupil wastage are expected to result from the introduction into British Royal Air Force service of the Percival *Provost*, new basic trainer which will be produced in hundreds to replace three-seat *Prentices* in RAF Flying Training Schools.

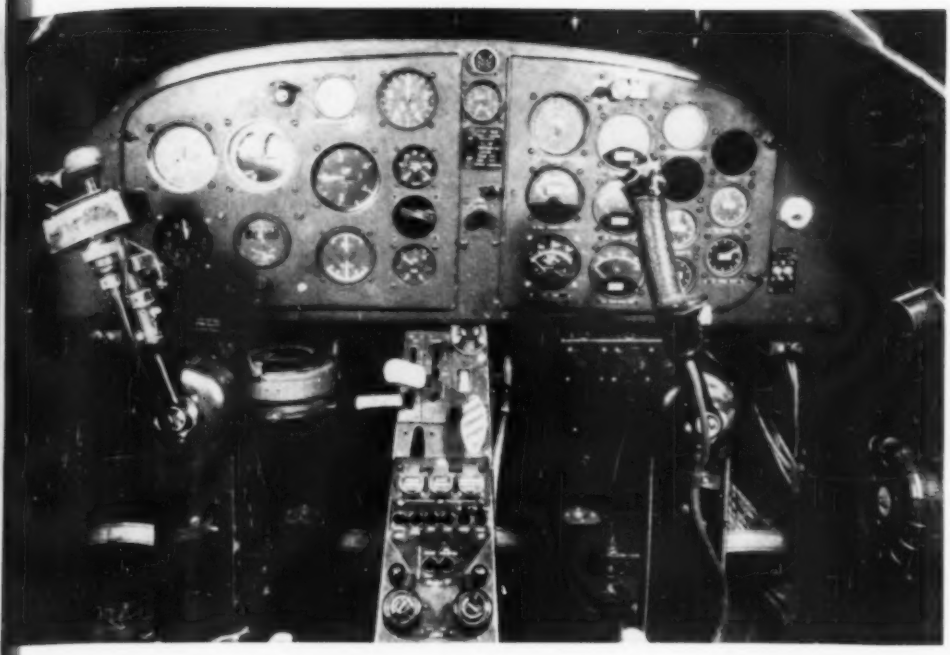
New ideas on pilot training worked out by British experts and tried out extensively since 1947 finally have shaken down and materialized in the *Provost* design, which also incorporates all the know-how gained in British, Canadian, South African, and United States flying schools during the war.

The big RAF problem has been how to produce better pilots needed to fly today's complicated operational types, yet cut training costs to the economy level. By replacing both the *Tiger Moth* primary trainer and the North American *Harvard*, the *Provost*, like the *Prentice*, will economize in aircraft.

Yet the *Provost* goes farther, for use as a "trainee filter" is a major aim of the design—to weed out at an early stage the pupils who will not make the grade as operational pilots.

During the war many trainees who did well during primary flight instruction later failed on heavier, complicated types. This was often due to inability of the pupil to split his attention between flying the plane and operating all the gadgets, flaps, undercarriage, radio, etc., not previously encountered. Potential wastage of this nature was one in every three, but after an extensive survey of the problem by U. S., British, and Commonwealth air forces, and collation of many thousands of individual "case histories," wastage was reduced to one in six by the introduction of scientific selection, grading, and aptitude tests.

The method of grading was difficult to fit into the peacetime RAF training syllabus, streamlined for economy, and

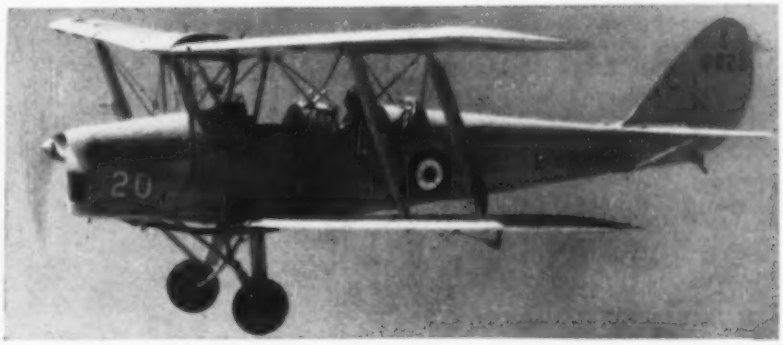


A view of the *Provost* panel shows instrument layout, the central control console, dual controls, and indicates the 45" cockpit width. Note the medico-designed standard stick grip on the right.

Policy leading to the *Provost* trainer is traced through these two predecessors. At bottom is the famous *Tiger Moth*, primary trainer now eliminated. The upper picture shows the Percival *Prentice*, 3-place trainer in use since the War.

ST New RAF Trainer

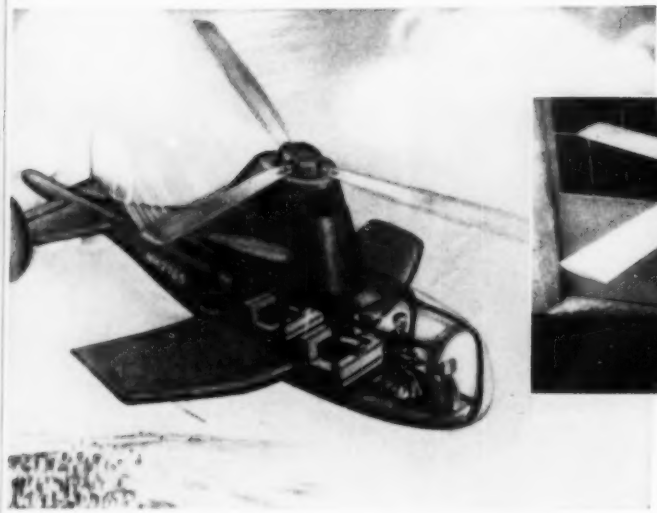
By ROY CROSS

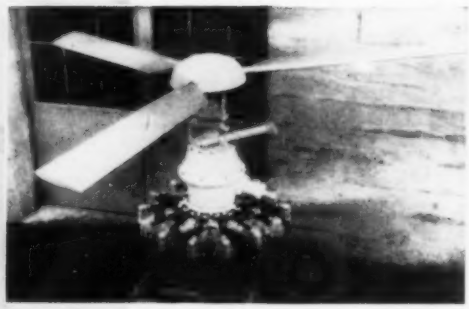


the method found to replace it was to stiffen initial flight training by introducing more complicated aircraft which exposed the inept pupil without loss of time or money.

The British 1943 T.23 specifications had called for the instructor to be seated beside the pupil, where he could closely observe errors and demonstrate visually correct flight procedure. Resulting aircraft, the *Prentice*, was built in quantity for the RAF and, despite shortcomings which were inherent in the very precise original specifications, largely proved the theories which led to its introduction.

Based on the later, less precise, T.16 specifications, (*Continued on page* 58)





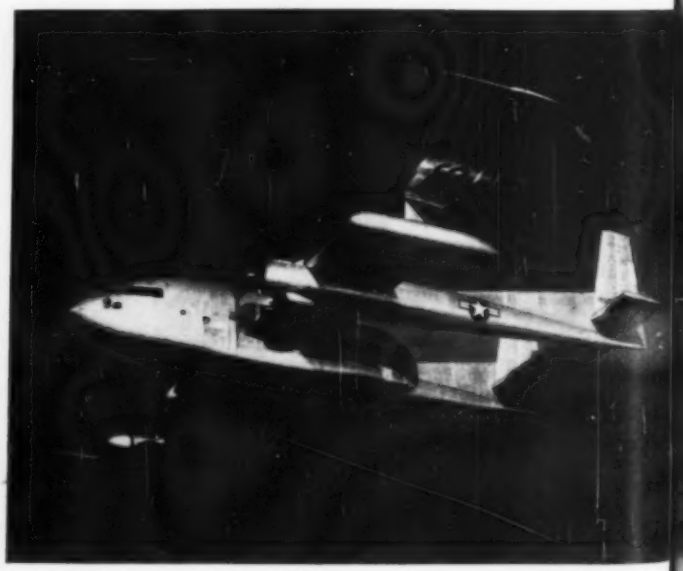
At far left is an artist's sketch of a five-place helicopter to be built by the Jacobs Aircraft Engine Co. The anti-torque helicopter will have a top speed of 185-190 mph and will cruise at 155 mph. For the helicopter, Jacobs has built the power plant package (left) in which transmission, controls, rotor unit and 350 hp engine are incorporated.

HAVE YOU SEEN?

World War II's famous Grumman *Avenger* has found a new use at the Navy's Special Devices Center, Port Washington, L. I. Equipped to test various radar gear, the craft has the special designation, TBM-3W2. Note the distinctive "guppy belly" which houses the radar.

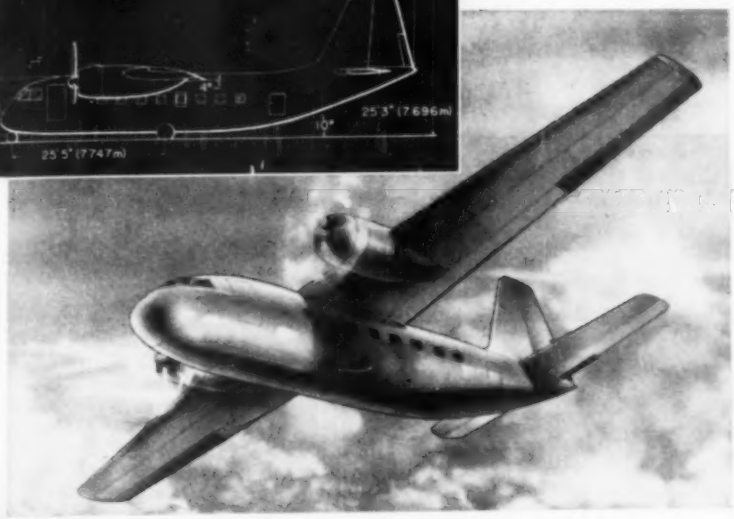
A new flying boat hull bottom (below), affixed to the wing and hull crown of the P5M-1 *Marlin*, is tested by Glenn L. Martin Co. The research model M-270 is 12 ft. longer than the *Marlin*. White lines correspond to lines on towing tank model and check tank test accuracy.

Latest addition to the Flying Boxcar family of medium troop and cargo transports is the Fairchild C-119H (below). New features include redesigned wing, rough-field landing gear, exterior fuel pods, greater payload, a longer range, and lower para-drop and touch-down speeds.



The world's largest helicopter, the jet-powered XH-17, (above), built by Howard Hughes' aircraft company for the USAF, undergoes ground tests. Powered by two modified GE turbojets, the XH-17 is designed for short-range moving of tanks, trucks, etc.

Zooming straight up from below is the Gloster GA.5, Sapphire turbojet, delta-winged fighter, now in large-scale production by the British.



Design work is in progress on the Canadair 21 transport (above), a twin-engine, high wing, pressurized passenger and cargo plane for local service and medium range operations. The aircraft will carry 32 passengers and crew of three and basic design calls for use of the Wright Cyclone 9HE engine. The insert gives the dimensions of the Canadair 21.

A Piper *Pacer* on Edo floats adds up to summer fun. Making the *Pacer* especially adaptable as a seaplane are high-lift flaps for quick take-off, doors on both sides and rear seat removable to carry bulky gear. 120 mph cruising speed and 500 mi. range.

NEVER TOO OLD

I read with much interest the item in your April Mail Box written by Albert W. Bailey of Elkton, Mich.

Having been an instructor who came in contact with a great many of the students and pilots in the Philadelphia area, I had one oldster who stood out among the several older men I had the opportunity to instruct in flying. He is Mr. Charles Evoy of Doylestown, Pa.

I feel certain that an interview with Mr. Evoy would provide some very interesting information.

VERNON D. SHAFFER

Pottstown, Pa.

● *We got in touch with Mr. Evoy and received the following advisory.*—ED.

I started flying at the age of 64 in February, 1946, and now have close to 1,000 hours. I live on a farm seven miles from Doylestown and have two runways, 1,800' by 100'. My airport is on the New York chart, "o-Evoy," and the name is on the hangar roof. Fliers are welcome to land.

I fly a Stinson 165, equipped with chutes, Narco Omnigator, which is a wonderful help in navigating, and all the necessary instruments.

I get quite a thrill from taking off at my home early in the morning and flying to the National Airport at Washington, D. C., and visiting my daughter and grandchildren for breakfast. I frequently fly to Atlantic City for breakfast, church, boardwalk and home again.

I use the plane in my wool scouring business.

I am now past 70 years, active in business every day and feel more at ease in my plane than driving my car.

Drop in, register in the guest book in the lounge room of the hangar and make yourself at home.

CHARLES H. EVOY
AOPA 31258

Doylestown, Pa.

SELF-STARTING TIRES

Regarding Hy Sheridan's article on self-starting tires in Logging Time (FLYING, June), may I offer the following:

The Navy Department conducted exhaustive research in the use of pre-rotating aircraft tires and found that the flaps built onto the sides of the tires tore off with use. No doubt they could be constructed to withstand this wear and tear but, even so, not enough pre-rotation could be obtained in this manner.

The Navy established in wind tunnel tests, in cooperation with the Air Force, that pre-rotating flaps could attain only about 50 per cent of the aircraft touchdown speed. Ninety per cent was established as the minimum pre-rotating speed which would prove practicable.

Electric motors are now being used as a means of pre-rotation and 100 per cent of the touchdown speed can be attained witth their use. The R6V-1 *Constitution* uses this installation.

Chance-Vought's F7P *Cutlass* uses compressed air directed onto turbine-like vanes on the nose wheel for pre-rotation. This is not so much to prevent tire wear as to avoid excessive strain on the long nose gear strut.

I would like also to point out that Navy tests determined that braking in the roll out, not touchdowns, was primarily responsible for excessive tire wear.

ROBERT L. WOOD
Captain, USMC

Glenmont Hills, Md.

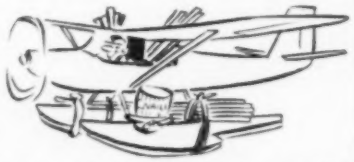
ALASKAN WILD LIFE

My wife and I own and fly a "90 *Champ*" on floats and ski gear. Our flying takes us over much of Alaska and we see more big game and other wild life in one day than most less fortunate pilots do in a year. Moose, caribou, grizzly and black bear, sheep and goat, wolf and bison (yes, bison) are not uncommon objects of our aerial observation.

As for fishing—well, the fishing opened up to us by plane is truly superb.

Our home—or homes—are accessible only by airplane, either floats or ski equipped. We live on large lakes in the Chugach Mountains and near huge Tazlina Lake and Glacier. Life in Alaska's rugged south central wilderness is pleasant and peaceful. Nearest neighbors are about 15 air miles and the neighbors are pilots, too. Nearest town is Palmer, about 95 miles from us.

Just at the moment we are building a large summer cabin, started in the



summer of 1951. Spruce logs are the basic material but we fly in other building materials such as nails, roofing, hardware and lumber. The lumber is wired into bundles of approximately six 12-foot boards and a bundle is fastened to each float. From there on, it's just ordinary flying.

Rick Houston

Via Palmer, Alaska

DIESEL POWER

Regarding "The Flying Diesel!" (FLYING, June), I am enclosing a photograph I took several years ago of a flying Diesel developed in Brea, Calif., by Fred Thaheld. The engine was flown in the Stinson pictured with good success. It was the first pancake diesel developed by Mr. Thaheld who has developed several radial diesels from three-cylinder to a nine-cylinder used in some of our tanks during the last war.

Your article led me to believe that Mr. Thaheld may have helped develop the engine described by Glenn Infield. I would appreciate it if you would let me know if Mr. Thaheld contributed to the development of this engine. He left Brea several years ago and may have joined the Pittsburgh corporation.

W. L. GOETSCH,
Aircontrolman

Operations 28
NAS, San Diego, Calif.

● *If Mr. Thaheld builds flying diesels he is almost certainly a* FLYING *reader. Here's hoping the above letter reunites him with an old friend.*—ED.

Fred Thaheld

PATRIOTISM'S PUNCH

May I offer sincere thanks for your editorial "Has Patriotism Lost Its Punch?" (FLYING, June). I wish everyone in America could read that—and I'm sure that those who do will stop and think. Maybe enough of them will think hard enough for something to be done about it.

I am almost 39 and looking back on my childhood I can remember the parades, speeches, flags waving in the park, the bands and the other things which stirred my soul and made me proud to be an American.

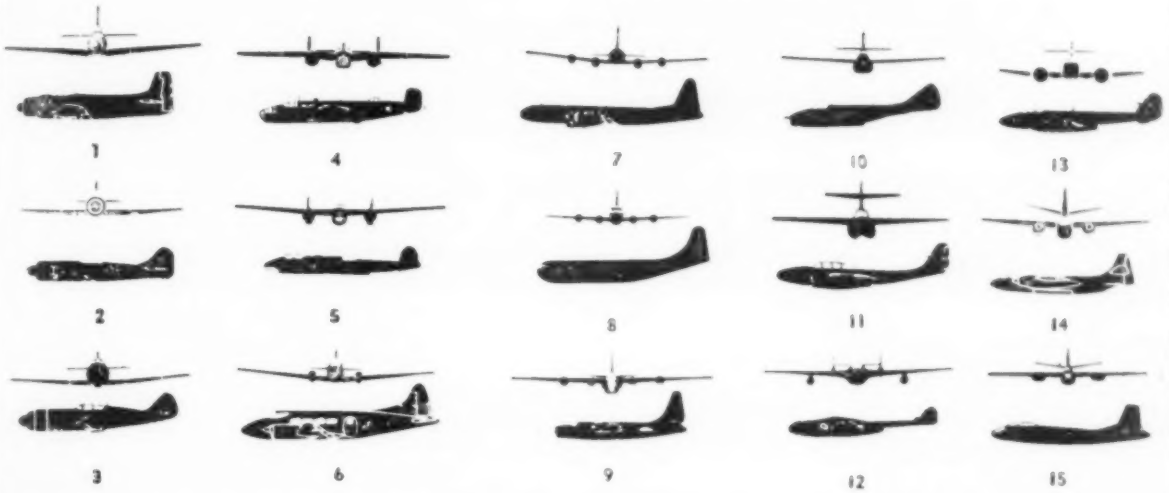
Someone came along and changed all that for my kids—and for me, too. I think the beginning of the end came when they banned fireworks on the Fourth. Following this came the trend toward Internationalism in the schools. You were supposed to think every other country was as good as yours. Today the so-called News Analysts do everything to tear down our democratic system by trying to make us believe that everything about it is rotten.

In spite of all this propaganda and the cynicism that permeates our youth—and us older ones—I agree with you that the young man of today still has a sense of duty and patriotism if someone would only appeal to it.

HOWARD W. SHOWALTER, JR.

Winter Park, Fla.

CAN YOU SPOT THEM?



Single Motor: 1. Douglas AD Skyraider; 2. British Hawker Tempest Mk. 2; 3. Russian LA-9 and LA-11. *Bi-Motor:* 4. North American B-25 Mitchell; 5. Russian TU-2; 6. British DeHavilland Dove. *Multi Motor:* 7. Russian IL-18; Boeing C-97 Stratofreighter and Stratocruiser; Consolidated-Vultee PBY-2 Privateer. *Single Jet Type:* Russian MIG-9; Northrop F-89 Scorpion; British Vampire Mk. 3. *Multi-Jet:* British Meteor 4; North American AJ Savage; North American B-45 Tornado.

New $33,000,000 Airport Serves Pittsburgh Area

GREATER PITTSBURGH AIRPORT, magnificent new air terminal, is giving many major cities pause for reflection. How did Pittsburgh do it?

Costing $33,000,000, the field was started in 1941 by the Federal government which invested some five millions to build a fighter base for defense of the Pittsburgh industrial area. After the war, it was turned over to Allegheny County which put more than $24,000,000 into it, with Federal and State appropriations completing the investment.

Ten million dollars of the County's money was for the terminal building—largest in the world. A seven-story, marble, glass, steel and concrete structure, it is the pride of Pittsburgh with its innumerable observation decks, lounges, dining room, theatre, 62-room hotel, coffee shops and stores. Located 14 miles south-west of Pittsburgh's "Golden Triangle," the 1,600-acre airport is situated in open country amid rolling hills. Its runways are 8,000', 6,200' and 5,770'.

Five airlines use the field—TWA, Capital, Eastern, All-American and Northwest—with 228 flights every 24 hours. Important in the air defense system, the field bases the Air Force's 71st Fighter Interceptor Squadron (F-86 Sabre jets) and the Air National Guard's 112th Fighter Wing (F-51's). Non-scheduled air freight lines and executive aircraft will continue to use the old County Airport east of Pittsburgh.

However, all local planes were on hand to help dedicate the new Greater Pittsburgh Airport on May 31st. Watching the arrival of the many light planes and the executive DC-3's, B-23's, Twin-Beech's, A-26's and *Lodestars*, a member of FLYING's staff wondered if perhaps the corporation names on many of the local planes could be a clue to Pittsburgh's backing of a top-notch air facility. Here are some of them: U. S. Steel, Mellon National Bank, National Supply Co., Pittsburgh Plate Glass, Jones & Laughlin, Oliver Iron & Steel, Joy Manufacturing Co., Mesta Machine Co., Coppers Co., and Gulf Oil Corp. Any community with that kind of corporation interest in air transportation can scarcely do less than build the biggest and best facilities for its air destiny.—CLH

OPERATORS' CORNER

LET'S FLARE UP

Several operators have requested information on airport emergency flares. The Standard Railway Fusee Corp., P. O. Box 30, Needham Heights 94, Mass., suggests 12 flares around a 50-foot diameter wind tee, or segmented circle for night signals, or 12 flares encircling a black smoke signal from oil or waste fire in a 20-inch diameter metal container. Case of 72 flares, $14.50. A recall signal of one hour would require 36 flares.

TR'S APPROVED FOR AIR TAXI

Evelyn Waters, Secretary of the National Air Taxi Conference, reports that the Military Traffic Service is preparing to use Air Taxi facilities for travel of government personnel on official business as it appears feasible. Members located near military installations are expected to benefit by this recent acceptance pending the development of necessary procedures.

AIRPORT TIP

There's a fellow named Morris who conducts a flight strip on Kent Island, a 15-minute flight from sweltering Washington, D. C. Located in Chesapeake Bay, it is a grand spot for those who couple fishing, swimming and flying. Enterprising Morris is selling homes along the strip to sportsmen-commuters. NATA checked on the installation, "Kentmore" by name, and reports a restaurant, two houses with built-in hangar opening on the runway. Yacht basin being built.

MAY DAY

Suggestion: Leave your telephone out where that transient pilot may use it. You think you'll lose money on "free" long distance calls. As an experiment, we tried it for five months and thought we'd lost one whole dollar. However, a local pilot showed up with the buck. Available telephone service means much to transients at odd hours on a small airport, and we sincerely feel it has made us money and good will.

HAULING AIRPLANES?

No matter how hard we try, it seems that an airplane will get away from us occasionally. The problem: how to get it back to the repair station. Some Operators hire flat-bed trucks; some tote the plane "piggy-back" on top of their autos, and some build special rigs to carry them. Here is such a vehicle.

This device was built entirely from pine boards and a worthless cracked airplane. The landing gear assembly came from an Aeronca *Champion*. The undercarriage is a welded triangular framework of ex-fusalage tubing, with the bottom "keel" of several bent lift struts welded together. Above the triangular structure, 2 x 4's were bolted in cross-ways for strength distribution, and 1 x 6 inch platform of #2 pine laid fore and aft. Dimensions are 16 feet x 6 feet 5 inches, with a 2-foot overhand in front for a ball-socket assembly.

WHAT is this experienced flight instructor doing? Amateurs consider this a waste of time. "The gauge's workin," they maintain, but William Abram, Chain O Lakes Airport, South Bend, Ind., makes sure.

The Fifth Annual Wisconsin Aeronautics Conference at Green Bay in May proved to be a first rate affair. Excellent presentations and discussions left those attending with many fine ideas for industry improvement. Particularly noticeable was the effort made to direct information and sell the aviation industry to many present from *outside* the aviation circle. "Bill" Lotzer of Milwaukee was re-elected president of the Wisconsin ATA. "Bob" Northington, President of NATA, and Director "Charlie" Parker were both present. Wisconsin State Aviation Director Tom Jordan was hailed by all for the grand job he is doing in the state. Shown at the meeting are: Bill Lotzer; Jules Parmentier of Green Bay, secretary; Dales Crites of Waukesha, vice president; Lyle Grimm, Wausau, treasurer, and Charlie Parker.

AIR TOURS ADVANTAGEOUS?

CAA reports 179,337 persons attended 76 air tour meets for soil conservation in 1952. In all, 9,376 flew and were sold (1) on need for conservation work, and (2) on aviation. Here's a sugar-coated pill that has a dollar bill inside. Charge per flight: $2-$3.

INFORMATION SERVICE

Jack Wussow, up in Sawango, Wisc., conducts both the airport operation and a seaplane base. Jack has made his services a real aviation center and encourages the public thereabouts to turn to him for all things aviation. His telephone directory advertising states: "Free information on airline schedules world-wide." It leads to many a new contact but, best of all, some new air taxi business too.

National Aviation Trades Association (NATA) is a service group that represents all service segments of the airport, fixed-base and air service operator. Its staff represents a federation of State Chapters and Members-At-Large. Its purpose is to fountainhead all activities of the American Operator, and to act as a sounding board for better public relations. Its aim: to improve air service operations and promote greater aircraft utilization.

Headquarters are located at 1346 Conn. Ave., N. W., Washington, D. C. Members receive a monthly "Washington News Letter" of confidential legislative and policy news in the making.

National Air Taxi Conference, same address, an affiliate of NATA, represents operators engaged in perfecting and standardizing a system of "through" air transportation.

Opinions expressed in this column are not necessarily those of FLYING Magazine.

Don't Guess About Your Future!

U.S. AIR FORCE

The Air Force needs trained Air Traffic Control Operators

The Air Force needs trained Ground Control Approach Operators

Your United States Air Force is expanding rapidly. It needs *YOU* and your special technical knowledge. Your skill and "know how" can serve your country and yourself to best advantage in today's vital job of national defense.

Eliminate the guesswork from your future and advance in your technical field to more profitable and satisfying rewards with your U. S. Air Force.

The Air Force needs trained multi-engine Flight Engineers

The Air Force needs trained Aircraft and Flight Mechanics

Here Are a Few of the Many Great Air Force Opportunities!

RADIO AND RADAR MAINTENANCE
AIRCRAFT ACCESSORIES MAINTENANCE
WEATHER • ARMAMENT SYSTEMS
FOOD SERVICE • WIRE MAINTENANCE
MISSILE GUIDANCE SYSTEMS
PHOTOMAPPING
INTRICATE EQUIPMENT MAINTENANCE
MUNITIONS AND WEAPONS • SUPPLY
VEHICLE MAINTENANCE • METAL WORKING
FABRIC, LEATHER AND RUBBER • MEDICAL
BUDGETARY ACCOUNTING AND DISBURSING
MARINE • FIREFIGHTING
SECURITY AND LAW ENFORCEMENT
CONSTRUCTION

Act Now!

MAIL COUPON TODAY for Full Information

AIRMAN PROCUREMENT
Headquarters, U. S. Air Force, Washington 25, D. C.

Please send me details about enlisting as an Air Force specialist.

NAME.....

ADDRESS.....

CITY.....*ZONE*.....*STATE*.....

MY SPECIALTY IS: .....

Million Dollar Idea

(Continued from page 15)

should consist of five crew members, namely a pilot, a photographer experienced in laboratory technique, and a sales force of three girls with top flight ability like those usually employed by magazine selling crews. With such a crew success is virtually assured, provided that from the outset the discipline is of the highest order.

Equipment needed can be bought in excellent used condition for well under $1,000, exclusive of car, which will leave enough reserve for operating expenses until the returns begin to roll in.

Having assembled necessary personnel and gear you go to a town of around 35,000 population where you and crew check in at a moderately priced hotel. You study the local area. There are usually four to six roads leading out of such a community. Next day your airplane takes off loaded down with gear and supplies. On a carefully planned pattern you fly low and slow along the network of surrounding roads. As the plane proceeds the photographer makes one shot only of each place of interest such as tourist courts, estates, orchards, country clubs, factories, schools, banks, stores, churches—in fact everything imaginable that looks as if its owner might have a few loose bucks lying around. Four hours of flying should produce about 200 photographs. Pictures taken within town limits make particularly easy pickings for the sales force.

After landing, the photographer hurries back to the hotel and the bathroom becomes a laboratory. He develops the negatives and makes contact prints of each shot.

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Sales Average High

Averages run from 75 to 90 per cent sales with price range somewhere between $10 and $20. The girls collect only a deposit on each order, balance C.O.D. on delivery of pictures by mail.

If these figures are multiplied by the 200 photographs taken daily you will have a minimum daily gross of around $2,400 and, if one-half of the days in a year are worked, the annual gross adds up to $432,000. If additional crews are operated, five such can gross over two million dollars with a net profit of half that amount to the operator.

One will ask what camera to use? I can only say that I use a 4 x 5 Graflex with an f 3:5 Carl Zeiss Tessar lens, although the regular f 4:5 Kodak lens compares favorably in my experience. Three specific adaptations should be made for aerial work, namely, installation of an outside glass view finder on top of the box, screen door handles on the sides for easy manipulation in the air, and an extension of the trigger release in relation to these handles. You may ask why a Graflex for such work instead of a regular aerial camera? I find that at low altitudes the former will out-perform the best of aerial cameras in general use. Also, the popular 4 x 5 size permits usage of cut film and coincides with laboratory facilities everywhere.

Detroit's Fifth Annual

Detroit-Wayne Major Airport will be the scene of the Fifth Annual International Aviation Exposition over the Labor Day week end, August 30 through September 1.

The air show will be held in conjunction with the annual meetings of the Air Force Association and the National Aeronautic Association and is sponsored by the Aero Club of Michigan. Through ground and flight demonstrations the show will present latest developments, by U.S. and overseas firms, in the field of military, commercial and utility aircraft.

The Continental Motors Trophy Race, flown during the exposition, will bring together the country's leading pilots of midget planes in competition for the Continental Trophy and $10,000 cash.

Also needed is a good contact printer and dryer. Then a large supply of cut film, developer and printing paper. Sales samples should be both halftone and photo.

Printing Excellence

Any fast panchromatic film such as Super XX, Super Pan Press or Defender #428 serves excellently. Cut film naturally is more desirable than film packs because of the difference in price and serviceability. About 100 film holders will be required per crew and these can be picked up used at approximately one dollar each. Developer must be fine grain due to the amount of fine detail in all aerial photos and for this same reason development must be slow and full. Printing paper should be double weight and glossy to show maximum detail. It is best to use higher contrasts since customers want sparkle which they regard as a matter of excellence. As to filters, due to the uniqueness of this plan you will be operating continually in favorable weather and at low altitudes. A filter is not necessary unless you start out too early mornings or haze is encountered. Then you will need a medium yellow and I suggest Ednalite or Carl Zeiss.

For lens settings under good light I suggest an all-around formula of f 6:3 at 1/800th or, if filter is to be used, lens should be opened one stop. This setting should give proper depth to your pictures with sharpness and the 1/800th shutter speed will overcome motion above 500 feet. Using this formula I have had farmers identify from photographs individual cows among their herds.

As to actual photography when airborne, government regulation prohibits flight lower than 500 feet over rural areas and 1,000 feet over cities. Thus these will be your basic altitudes. As to speed, an Aeronca or a Cub stalls at around 35 mph, so flight of 60 mph is well within the bounds of safety. However, any airplane, large or small, has a certain amount of vibration and camera movement is of major importance. Great care must be exercised that the camera is held firmly with no part of the body from the waist up in contact with the air frame.

Central Finishing

You will wonder about the finishing plant to make the enlargements, post cards, murals and other work. In handling such a large volume, simplicity is essential. When the girls turn in their orders at night, corresponding negatives are taken from the master file and mailed with instructions to a photo finishing plant, many of which are located in larger cities throughout the country. As a regular service to professional photographers these plants fill orders and mail them C.O.D. to customers. The C.O.D.s are returned to your home office or to your bank for deposit. Charges for this service are but a fraction over what it would cost you to do this work yourself and much of your drudgery is eliminated.

What about winter time? In my plan there is no winter. The money is where the sun shines! In early fall the Virginia and Carolina farmers have their tobacco harvest receipts. In late fall cotton is paying off in the deep South. After Christmas Florida fills with tourists. Spring brings Mardi Gras time to New Orleans and Southern California is ripe for more than oranges. In summer the North West beckons as do the Great Lakes area and all of New England. Traveling with the sun, it would take a single photographic crew a hundred years to comb the country!

Then what is the catch to the plan? Primarily you must turn out pictures of exceptional quality. Your sales staff must be top flight. Pilot and photographer must be highly responsible individuals. Everybody must be willing to work hard and capable of cooperation. It is the pilot's job to see that the plane is always flyable, and the photographer's job to see that the girls have their prints ready for sale each morning. The operator must be the guardian angel of everything and everybody yet keep drive, discipline and morale at a high pitch. The big temptation is to relax and enjoy profits because they are big also. Yes, the catch is too much money too fast for all. If you can lick yourself, you can lick the job. END

Lockheed

STARFIRE NEARLY AUTOMATIC FIGHTER

On the opposite page you see illustrated in action the nearly automatic Lockheed *Starfire* (F-94C). This all-weather jet fighter is an electronics masterpiece with an interesting development history.

The "C" is the third in the *Starfire* series and is now being delivered to the U. S. Air Force to augment squadrons of F-94A's and F-94B's now on 24-hour duty as protection for such key cities as New York and Washington.

The evolution of the *Starfire* actually dates from the spring of 1945, when Lockheed developed America's first operational jet fighter, the F-80 *Shooting Star*. From the F-80 came the T-33 two-place jet trainer now used to train 9 out of 10 U. S. jet fighter pilots (also pilots from 9 other nations).

In turn the T-33 was redesigned to incorporate the most advanced electronic equipment known as well as some unknown devices that had to be specially invented. This became the U. S. Air Force's F-94 *Starfire*, now developed to the point where it both flies and fights with more than human accuracy. It has an all-rocket armament—no guns!

Electronics innovations include the Westinghouse Autopilot and Sperry Zero Reader. It is one of the few fighter-type planes equipped with ILS (instrument landing system) for low-visibility landings. *Starfires* pack 1200 pounds of electronics, compared to 168 pounds of radio in the Lockheed P-38 of World War II.

The *Starfire* is the first production aircraft to fly with the new Pratt & Whitney J-48-P-5 jet engine. Its afterburner provides extra power for rapid take-off and extra performance in battle.

The F-94C is the largest of the original Lockheed jet series. The statistics: take-off weight, more than 2000 pounds; length, 41 feet, 5 inches; wingspan, 37 feet, 6 inches; height, 13 feet, 7 inches.

A pioneer in the jet field, Lockheed has produced more jet aircraft than any other manufacturer.

A Chapter in the Will Rogers Story

Release of the new movie, "The Story of Will Rogers," inspired the editor to dig into his personal file for the above photo of Will and Robert L. Copsey. The picture was taken at Newark Airport in the days when that famous field was a cinder strip where Will Rogers liked to sit around in the sun and hangar fly with all of us. Copsey, who is now Brigadier General Robert L. Copsey, Special Assistant to Chief of Staff for Reserve Forces, was then head of Newark Air Services. In those days the mud at Newark was deeper than the present confusion and Will Rogers had the distinction of being the intimate friend of more "grease monkeys" than any other public figure. In the movie, which recalls many of Will's air activities, he is portrayed by his son, Will Rogers, Jr., and Wiley Post is played by Noah Beery, Jr. —GRW

Alaska's Cross Country Dentist

(Continued from page 27)

a trout, but he adds, "it's gotta be good and solid." Once he jerked out a couple of human teeth in exchange for a fossilized mastodon molar.

Doc lists three essentials to his Alaskan practice: "my dental tools, a missionary spirit and this Aeronca *Sedan*." Without all three he might still find himself today, as he was five years ago, a struggling dentist whose practice was anything but oversized. As for the Cadillacs, he passes them off as "pure luxuries." His plane, however, is a necessity, and already he's logged more than 2,000 hours jumping around his circuit of four or five Alaskan villages which, without him, would have no dental care.

Dillingham is 340 air miles southwest of Anchorage. In between are the glaciated Chigmit mountains with peaks jutting up to 8,000 feet. Across Kvichak Bay from Dillingham is Naknek, another village on Doc's circuit. Homer is about 150 miles south of Anchorage and to get there Doc flies right over the Kenai National Moose Range. Cordova is 170 miles southwest across Prince William Sound, and Doc makes occasional visits there. There are a couple of other little Alaskan towns which look forward to semi-annual visits. Nor is this the limit to his aerial gallivanting. As owner of the Butte Supply Co., Alaska's only home-grown dental supply house, he or his dental assistant (who also holds a private license) often jumps off on delivery errands, flying supplies to other Territorial dentists.

Doc McKinley is a careful pilot, which explains why he estimates the distance from Anchorage to Homer as 150 miles when as the crow flies it's actually a little over half that. "You don't find me taking any chances. The jet boys over at Elmendorf Field can hang their hats on the mountain tops, but I like the valleys—providing they're wide. Usually I give anything higher than a good-sized bluff a wide berth, if I can."

Part of Doc's airborne caution stems from the fact that it wasn't until 1946 when he was 40 years old, that he got his private ticket. He's also aware of all those "Xs" that dot the wall map of Alaska hanging in the headquarters of the Air Force's Alaskan-based 10th Rescue Squadron. Every "X" represents a down plane—and many are merely surmises as to a ship's final resting place. Doc doesn't hanker to become an "X" on anybody's wall map. So cautious is he at the controls that flying buddies sometime refer to him as the "cross-country grandfather." But he gets there, and he gets off the ground again—and that's what counts in

Million Dollar Idea

(Continued from page 15)

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Equipment needed can be bought in excellent used condition for well under $1,000, exclusive of car, which will leave enough reserve for operating expenses until the returns begin to roll in.

Having assembled necessary personnel and gear you go to a town of around 35,000 population where you and crew check in at a moderately priced hotel. You study the local area. There are usually four to six roads leading out of such a community. Next day your airplane takes off loaded down with gear and supplies. On a carefully planned pattern you fly low and slow along the network of surrounding roads. As the plane proceeds the photographer makes one shot only of each place of interest such as tourist courts, estates, orchards, country clubs, factories, schools, banks, stores, churches—in fact everything imaginable that looks as if its owner might have a few loose bucks lying around. Four hours of flying should produce about 200 photographs. Pictures taken within town limits make particularly easy pickings for the sales force.

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PAC

MISS

Lockheed

GES

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Will Rogers Story

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d Robert L. Copsey. The picture was taken
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ngar fly with all of us. Copsey, who is now
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ces. In those days the mud at Newark was
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Part of Doc's airborne caution stems from the fact that it wasn't until 1946, when he was 40 years old, that he got his private ticket. He's also aware of all those "Xs" that dot the wall map of Alaska hanging in the headquarters of the Air Force's Alaskan-based 10th Rescue Squadron. Every "X" represents a downed plane—and many are merely surmises as to a ship's final resting place. Doc doesn't hanker to become an "X" on anybody's wall map. So cautious is he at the controls that flying buddies sometime refer to him as the "cross-country grandfather." But he gets there, and he gets off the ground again—and that's what counts in

Alaska's fickle weather.

Caution Pays

It's Doc's theory that in Alaska's turbulences, "the fools automatically eliminate themselves." When Doc's ready to climb into his Aeronca for his nightly commuter run to the farm, he calls the CAA tower at Merrill Field. If they say the weather's OK, he drives to the field, checks over the controls himself, sees that the engine is sufficiently warm in the cold arctic weather, climbs up a few thousand feet and files a verbal flight plan. Even though it's only a 20-25 minute flight to his farm, he checks in with the tower 15 minutes later. Always he follows VF rules.

On longer flights, say to Homer, Doc lets people know by radio or letter exactly what day he's coming and what hour to expect him. If there's any question about the weather, he doesn't take off. He checks in every 15 minutes either with the Merrill Field tower or with CAA stations along the way. "It's not strictly required even up here," he says, "but it's for your own safety. If you don't show at your arrival point within 30 minutes, the boys usually alert the 10th Rescue Squadron. If you've been calling in every 15 minutes, they'll at least know where to start looking."

Every morning before taxiing off his farm's strip, Doc tunes in on the Anchorage CAA station for early-morning weather reports. In five years of daily commuting, Doc has missed only one day at the office and that was in winter when the temperature was down to —40 degrees and a stiff wind was blowing. He couldn't fly and the roads were snow-blocked. About six months out of the year he can count on flying to work and back, although occasionally he'll arrive over Merrill and find it socked in. In that case he turns around and either flies back to the farm or skis down upon a close-by strip and waits out the weather. "Usually in about 30 minutes I can make it," he says.

Aeronca Favored

Doc McKinley is partial to the Aeronca, and in six years he's had three of them. His first was a *Chief*, which he discarded after a year in favor of a *Scout*. Last year he traded that in on his present four-place Aeronca *Sedan*. He yanked out the back seat and in its place he carries a portable dental chair, a small electric engine to power his drills, and a case of extraction tools. There's also room for a Kohlman stove, upon which Doc boils water for sterilizing his instruments. He's always careful to stash away emergency equipment: sleeping bag, "C" rations for three days, snowshoes, pickax, flares and sidearms. "A downed pilot occasionally meets a bear or a fighting-mad cow moose —and that's what the gun's for," he explains. Even with this load he often takes along a dental technician to make plates and inlays. "Our dentistry, by necessity, is done right on the spot. You can't tell a patient to wait for his false teeth until your next visit."

His practice is more closely tied to the airplane than even all this would indicate. Patients are constantly flying in from remote Alaskan areas. "Our appointments are often gauged by airline schedules," says one of his office assistants. "Just the other day an old prospector flew in from Pt. Barrow. He hadn't brushed his teeth from the day God gave them to him. We rushed him through, even though he had no appointment, and two days later he was heading back by plane for his claim, with a new set of choppers."

While I was in the office, a couple of patients came in from Gambell, on St. Lawrence Island, which is 1,500 miles northwest of Anchorage, and only a scant hundred or so from Kivak in Russian Siberia. They'd flown in by Alaskan Airlines and Doc shoved them ahead of patients who'd had appointments for a month. "People up here understand. Every day I delay a 'fly-in' patient, it's costing him money for standby time," Doc explained.

Ambulance Case

Doc's *Sedan* is also an air ambulance on occasion. Not long ago a patient in a lonely Indian village sent word that his gums hurt. Doc had examined the man previously and knew he'd have to have all his teeth pulled. That, in Doc's book, is a hospital case. So his dental technician flew out, picked the patient up and brought him back to an Anchorage hospital. Three days later Doc's *Sedan* toted the man back to his village.

Only once has Doc had even a close brush with accident, and that was in the summer of 1950. He'd taken off from the Anchorage airport about 5 p.m. and headed northeast toward Palmer and the landing strip bulldozed near his spacious farmhouse. He was flying the Aeronca *Scout* and as he headed up the Knik river, things got rough. The Knik has the nasty habit of becoming a natural windtunnel on occasion. A 70 mph wind was raging down the Knik and rain squalls picked up the little ship and all but pushed it backwards. "Brother," recalls Doc, "I thought I'd had it then. Luckily the river was low and I managed to sit the ship down on a sandy beach and tie her to a log. It was only a short walk to the highway, so I got home all right. Next morning I flew out of there and arrived at the office on time."

When Doc first landed in Alaska—by car, not plane—he thought he'd be satisfied to settle down in Anchorage to routine practice.

One day a patient dropped in from Dillingham. He liked Doc and his work, and before the novocain wore off he was telling Doc the sad state of dental affairs in many an Alaskan small town and village. "No dentist," the visitor complained, "but plenty of teeth—and most of them bad." That was November, 1946. A month later the patient returned, and this time he brought a delegation. "We've come to fly you back to Dillingham. We need a dentist bad—just for a week or so—and most of the folks can't afford to come to you." Doc stowed his tools in a bush plane and a few hours later set up shop in a Dillingham hotel. In two weeks he saw 100 patients, about three-quarters of them Indians, and "got the missionary spirit."

Plane Means Independence

Doc didn't like the idea of being dependent upon somebody else's bush plane, so he decided to get his license. He'd fooled around in Piper *Cubs* as far back as 1940, because his brother had an interest in Detroit's McKinley School of Aviation. But Doc had never bothered to get his license, so he had to start from scratch.

As I left Doc McKinley's office a message came in from Naknek. The townspeople wanted to know when Doc could drop over since they had some cases that needed emergency treatment. Doc told his secretary to send a radio message that he'd be over in a few hours. Then he phoned Charles Hallock at United Airmotive Inc., who services his Aeronca. "Can you have my ship ready in three hours?" Hallock agreed, and Doc phoned the CAA for his weather dope. "Good flying," he announced after he hung up. "Naknek's about 330 miles southwest of here. It's 9 a.m. now, and I'll get off by noon. Plenty of time to make it before dark."

It was cold outside, with the thermometer hanging at —30 degrees, and it would take Hallock about three hours to warm up the ship, sweep the snow off the wings and refuel. As I left, Doc was gathering up his dental tools. His lab technician was going along, too. "See what I mean about this country?" Doc said, "Hell, you'd be lost without a plane." END

MORE 6B'S FOR SAS

Looking ahead to continued success of tourist travel across the Atlantic, Scandinavian Airlines has ordered six more Douglas DC-6B's, in addition to eight recently put into service. The new order brings the fleet of DC-6's and 6B's to 26.

Airway Manual

(Continued from page 17)

Who uses *Airway Manual*? At present more than 2,000 private, corporation, military and charter pilots. In addition, Jeppesen supplies more than 90 per cent of the airlines with special tailored versions of the *Manual* to tie in with each company's own particular operations book.

Nine years ago when the Navy desperately needed a pilot guide for its far flung routes, it turned to Jeppesen. He had the books ready within a matter of weeks and has ever since been producing the *Navy Airways Pilot*.

Only recently, joint planners for the Army-Air Force maneuver Longhorn needed let-down charts for four Texas airports. Jeppesen came up with the charts in a few hours.

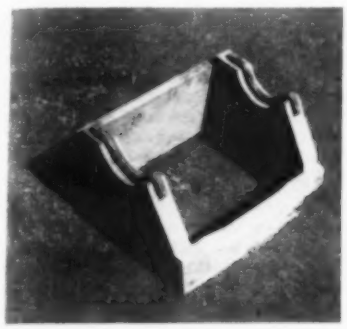
Perhaps Jeppesen's own flying background—he became a pilot at age 16 and has 15,000 hours—accounts for his fanatical insistence on precision and service. He knows what the man in the cockpit needs when only the most accurate and timely information can see him through. Of all unique contributors to aviation, the man with the little notebook back in 1929 ranks well up with those who have built American commercial supremacy. END

PILOT AIDS

BY BOB BLATT

NOSE REST PREVENTS TIPPING

HERE is a substantial light plane nose rest for use in stacking planes in the hangar and saving space. It is extra strong in construction and is claimed to be practically tip-proof, according to its maker, Pete Brucia. The total cost to make it was 60 cents, since it was constructed from scrap wood found around the field. The sides were cut from 2 by 12s. They are 10 inches high and 12 inches deep, and are supported 15 inches apart by one inch thick boards. The side supports are grooved to take the propeller and are cushioned on top by ⅛ inch scrap rubber gas line hose. This is certainly a big improvement over the ordinary wooden box used at many fields.



AERIAL CAMERA

BY BUILDING into a light plane complete provisions for aerial camera equipment, this operator was able to obtain all the flight business from an aerial photographer and still use the same plane for flight instruction and other rental. A five and one-half inch square opening was cut in the right side rear plastic panel to accommodate the camera for oblique views. The rear seat floor-board was cut for a six-inch round and a two-inch square opening. Twenty-four ST aluminum was used to reinforce the openings on top the floorboard and around the sides of the six-inch hole. The underside of the floorboard was also protected with a fairing of 24ST aluminum, around the holes for the vertical camera shots. Manager Daniel L. Craft, of the Gulfport Air Service, Gulfport, Mississippi, worked out these details with the aerial photographer who had contracted for flight time for his photographic work.

VISUAL MB-3 AURAL

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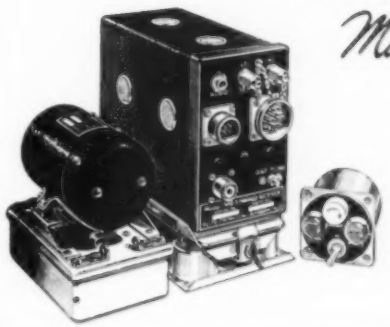

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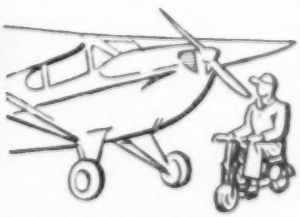

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ARGYLE MANUFACTURING CO. COLCHESTER, ILLINOIS

Russia's Air Youth

(Continued from page 19)

selected designs. Five designs were chosen for prototype construction and the winning designs, intended for mass production, will be chosen after comparative flight trials to take place toward the end of this year.

Designer	Dimensions Span	Length	(mph) Top Speed	(mph) Landing Speed	(lbs) Useful Load	(lbs) All-up Weight	(ft) Service Ceiling	(hp) Engine Power
Gribovskii	37'5"	23'2"	120.5	40.5	548	1,655	17,680	90
Elibekyan	38'2"	.....	118	37.5	595	1,830	.....	90
Nikitin	30'6"	21'0"	90	34.5	282	881	14,800	50
Ollo & Shprangiel	27'11"	23'4"	198	54.5	440	1,830	22,000	225
Golayev	23'0"	18'9"	190	68	.....	1,100	.....	90

Of the designers whose prototypes are now under test or construction, only one, Vladimir Gribovskii, is known to the West, the others being newcomers to the Soviet airplane design field. Gribovskii, who has hitherto specialized in the design and construction of training gliders, has produced a neat tourer/trainer powered by a 90 hp radial (probably a version of Arkadii Shvetsov's well-tried M-11). It is a low-wing monoplane of stressed-skin metal construction with fixed, levered-suspension type nosewheel landing gear. The cabin is enclosed by a single piece perspex hood and seats instructor and pupil side-by-side with dual controls.

Another side-by-side two-seat primary trainer has been designed by S. Elibekyan and this, like Gribovskii's airplane, is powered by a 90 hp radial and possesses fixed nosewheel-type landing gear. Apart from these features, Elibekyan has approached the design from an entirely different angle. His airplane is a fully "slotted-and-flapped" high-wing monoplane using mixed metal and wood construction.

Also featuring high-wing configuration and liberal "slottery-and flappery" is V. Nikitin's ultra-light single-seater trainer/tourer powered by a 50 hp "flat" engine. This little airplane has fixed nosewheel-type landing gear and fixed leading-edge slots, and has been designed for assembly by the flying schools from kits of parts supplied to them by DOSAV.

A new design team comprising M. Ollo and V. Shprangiel have produced a fast single-seat advanced trainer and sporting monoplane which features some degrees of forward sweep on the wing leading edge. Powered by a 225 hp radial, this little airplane has an estimated top speed of 198 mph. Metal construction and fabric covering are employed and a fully retractable tailwheel landing gear is fitted.

Another single-seat low-wing monoplane is the clean Golayev airplane, intended primarily as a record-breaking machine in the F.A.I. Class 1 for airplanes up to 1,100 pounds all-up weight. Golayev has used a TsAGI laminar wing section and his design is aimed at providing high performance and long endurance. Powered by a 90 hp radial, the airplane is of wooden construction throughout. END

T. R.'s Aeroplane Ride

(Continued from page 13)

"Right now, Colonel. I'm ready right now. How about you?"

For an answer, Roosevelt threw his silk hat to the ground, grabbed a flying cap and started aboard. The Colonel's friends gathered around, dumbfounded. Roosevelt roared out: "All right. Let's not make too much fuss about it while I am getting into this machine." He continued to cluck "Greats" and "By Georges" while Hoxsey crawled alongside.

While several State Guardsmen steadied the plane, Hoxsey started the engine for its pre-take-off warm-up. The motor sputtered, coughed a couple of times and quit. Hoxsey felt his throat turning dry. Glancing over the apprehensive crowd, he began to wonder whether or not he should call the whole thing off. Then the motor caught and purred steadily and a reassuring look at his laughing, lighthearted passenger told Arch it was time to shove off. "What do you say, Colonel?", he shouted above the motor's roar. "Are you ready?"

"Ready," Roosevelt replied. "Let's go."

Hoxsey applied power and the aeroplane began to skid across the ground. Out of the corner of his eye he could see Roosevelt gripping the rails and hanging on for dear life, his square jaw jutting straight ahead. A few bumps and they were in the air.

Politics Aloft

Lifting the machine to 150 feet, Hoxsey began making a wide sweep around the people below. Half-way around the first lap, he felt the aeroplane shudder and slip. A glance at his partner revealed the trouble. Roosevelt was out of his seat, waving fiercely to the spectators on the ground. His shifting weight had tipped the aeroplane beyond the aviator's ability to maintain level flight.

Without regard for his passenger's rank, Hoxsey grabbed Roosevelt's coat with his free hand and shouted: "Sit down, Colonel. Sit down and hang on." Reluctantly, T. R. regained his seat.

Well into the second lap, Hoxsey was endeavoring to keep an eye on his exuberant cargo in addition to flying the aeroplane. Hanging above their heads was the valve cord which served as the engine shut-off. Roosevelt began to wave at the crowds again, his hand flicking close to the shut-off rope. "Be careful," Hoxsey roared again. "I forgot to tell you that the engine quits when you pull that rope."

Roosevelt looked at the cord and showed his teeth. "Nothing doing," he said.

Satisfied to let well enough alone, Hoxsey headed back for the ground, no less anxious than the waiting members of the ex-President's party to end the flight. By now Arch was in a sweat, and when the plane touched down he felt tremendous relief. Waiting troopers steadied the machine and Hoxsey confided to one of them: "I was never so glad of anything in my life as when you fellows took hold."

Passenger Reaction

Roosevelt disembarked from the machine derriere-first and became embarrassingly entangled in the wires before friends could extricate him. No matter. The Colonel couldn't suppress his delight. He shook hands all around, patted the aviator on the shoulder: "By George, Hoxsey, you were great. Great! It was great. Greatest experience I ever had in my life."

Hoxsey stood wiping the sweat from his face. T. R. jumped back into his car and was off down the road to keep his speaking engagement in Kinloch. Le Blanc, a French pilot at the field, took to the air. Diving, dipping and soaring, he circled above Teddy's car as the caravan disappeared down the dusty highway. Roosevelt couldn't keep his eyes off the wonderful aeroplane. All the way to town he repeated happily: "By George, it's great. Simply too fine for words." END

★ A Flying Tip ★

C. R. Williamson, flying radio evangelist of Bloomington, Ind., offers the following blueprint for pilots who, after making a forced landing in a short, soft field, are faced with the problem of flying out:

1
Set brakes.

2
Open throttle until maximum rpm's are reached.

3
Release brakes and raise the tail to flying position as soon as possible.

4
When the ship carries the tail solidly, begin to bounce the ship on the main gear by sharply rocking the stick or wheel back and forth.

5
Avoid bumping the tail on the ground.

6
Continue bouncing until the ship pulls up solidly.

7
Avoid holding the ship off. If it wants to sink, bounce it again. Once solidly airborne it is possible to make quick pull-ups over obstructions.

Williamson promises this procedure will get you out of the field in a little over half the usual take-off run.

AIRCRAFT OWNERS AND PILOTS ASSOCIATION

AOPA NEWS

NO KNOTS

Civil aviation has won its fight against the CAA and military air services over knots and nautical miles.

The long uphill controversy ended with the decision of the Civil Aeronautics Board, following a day-long public hearing before the Board in which all segments of civil aviation took their turns at castigating the CAA and its arbitrary edict forcing the nautical mile on civil aviation over its strong objections.

It was only AOPA's determination to bring the matter to an open, public hearing that ultimately led to the victory. All segments of civil aviation had been told by CAA some time ago that the nautical mile would be the single standard unit of distance measurement, effective July 1. Despite the protests of industry, including strong personal and written protests by AOPA and the Air Transport Association (representing the nation's 40 scheduled airlines), the CAA was adamant and decreed that the new unit of measurement would go into effect, whether the industry wanted it or not. The airlines reluctantly gave in, and started converting their aircraft instruments and manuals. AOPA, however, was determined to fight the matter through, not only to defeat the nautical mile but to expose the high-handed system used by the CAA and military to force it on the industry.

It all started back in 1949, when military aviation representatives participating in an all-Government-agency meeting, commented that they felt a single unit of distance and speed measurement was needed on the Federal airways, and that the nautical mile and knot was the system to adopt. Those units are widely used for long-range over-water navigation, and had been agreed upon by the International Civil Aviation Organization in Montreal as the single standard for civil aviation throughout the rest of the world.

The nautical mile proposal next turned up in the Air Coordinating Committee, another high-policy group made up solely and exclusively of Government agencies. That organization, and its subcommittees, voted unanimously to make the nautical mile the single standard for all civil aviation in the U. S. The CAA, presumably charged by Congress with "fostering and promoting" civil aviation, voted with the military. Non-government users of the air space sat in on some of those meetings as observers, and voiced repeated protests. However, voting was—and is—confined solely to Government agencies, and the aviation industry was voted down.

First effective chance for the industry to fight back came when the CAB recently started the customary legal procedure of changing the Civil Air Regulations to specify the knot and nautical mile as the single standard. The law requires that the CAB circulate the changes it proposes to the aviation industry, seeking the industry's comment. Seeing its first chance to get a fair hearing, AOPA immediately turned the entire project over to Merrill Armour, AOPA Washington counsel and a former CAB attorney. Armour quickly rallied the entire aviation industry to the fight, then filed a formal request for a public hearing before the CAB. All segments of the industry quickly answered the call. The result was a devastating public condemnation of the CAA and military for (1) forcing the nautical mile on civil aviation over its objections, and (2) for the high-handed, dictatorial methods used to force the system through.

These individuals and organizations participated with AOPA in the public hearing:

Milton W. Arnold, vice president, Air Transport Association (representing the nation's 40 scheduled airlines); Col. A. B. McMullen (AOPA A62782) of the National Association of State Aviation Officials; Clarence Cornish (AOPA 80593), director of the Indiana Aeronautics Commission, representing that organization and the flying farmers of Illinois, Indiana, Wisconsin and Michigan; Carleton Putnam (AOPA A1345), chairman of the board of Chicago and Southern Airlines; Robert Love (AOPA 1427), president of All-American Airways; Wayne Weishaar (AOPA 80874), executive secretary of the Aeronautical Training Society; Dr. R. A. Peatee (AOPA A63716), Bowling Green, O.; Robert M. Girard (AOPA A35280), Brightwaters, N. Y.; Robert Northington (AOPA 10835), vice president of Piedmont Airlines; Capt. R. C. Robson of American Airlines; Joseph Geuting (AOPA 26139), director of the Aircraft Industries Association's Utility Aircraft Council; J. B. Hartranft, Jr., AOPA general manager; and Mr. Armour.

One of the most important factors in the fight was the thousands of AOPA members who participated. As can be seen by the above list, many of the people who made statements at the hearing—56 per cent, actually—were AOPA members.

The hearing was before three of the five members of the CAB: Donald W. Nyrop, chairman; Oswald Ryan, and Joseph Adams. All three voted in favor of civil aviation soon after the hearing.

Two CAB members—Josh Lee and Chan Gurney—were not in Washington when the hearing was held. They returned later, and voted against civil aviation. However, the 3 to 2 vote won the fight for civil aviation.

A verbatim record was made of the entire hearing. That complete transcript is being published verbatim in the August and September issues of the AOPA PILOT.

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CIVIL AIR PATROL

WING TALK

THE AIR BROTHERHOOD . . .

Air cadets of clubs in 15 nations will look back on the 1952 International Cadet Exchange with the knowledge that it was truly an international project, carried off on the grandest scale since the I.C.E. inception in 1948. Then it was a "pilot model" exchange between youths of the Civil Air Patrol and the Air Cadet League of Canada, but pointing to the day when most of the free world would come in for this shot in the arm to world understanding. The 1951 and '52 Exchanges amounted to that.

Now in progress is perhaps one of the most extensive youth exchanges ever attempted. More than 200 of these young "air ambassadors" are exchanging countries for two weeks to observe aviation and customs and places away from home and home aero affiliations. The Danes are hosted by the Texas wing of CAP, cadets from Portugal are in Michigan, the Swedes (you guessed it) go to Minnesota, Wyoming CAP has the boys from Belgium, North and South Dakota are teamed as hosts for the 25 youths from England. Florida has the 25 guests from the Air Cadet League of Canada. (These are the two exceptions to the five-per-country-rule.)

The Norwegians go to Indiana, the Italians to New Jersey, the Spanish to Colorado, the Brazilians to Montana, the Dutch to Ole Miss, the Mexicans to Kentucky and the Swiss and French to Illinois. There the U. of Ill. figures centrally in providing a basic flight course. In Switzerland and France the CAP cadet exchanges are being treated to gliding and soaring.

CAP Cadets Ernest Bronkfield, San Francisco; Alfred Goddert, Brandon, Vt.; Larry Greathouse, Hutchinson, Kans.; Joseph Litchfield, Roy, Utah; and Roger Menzies, of Portland, Ore., have gone to The Netherlands, accompanied by Lt. Col. George Swain, of the Maine Wing.

CAP Cadets Harvey Alburn, Franklin Sq., N. Y.; Everett Boid, Casper, Wyo.; Robert Buell, Pipestone, Minn.; Don Nelson, Sparks, Nev.; and Charles Whitehurst, Flemington, W. Va., are in Norway, accompanied by Maj. Ralph Helgeby, of the Michigan Wing.

CAP Cadets Joseph Brogan, Vallejo, Calif.; Rafael Godoy, Rio Piedras, P. R.; John Hanson, Bismarck, N. D.; William Query, Orlando, Fla.; and Conrad Waby, Sioux Falls, S. D., have gone to Portugal, accompanied by Maj. Allan Lydiard, of the Massachusetts Wing.

CAP Cadets David Bonnet, Alamosa, Colo.; Lester Querry, Hagerstown, Md.; Jon Shutt, Tijeras, N. M.; Howard Simpson, Jackson, Miss.; and Andrew Wallace, Lexington, Ky., are in Spain, accompanied by Lt. Col. Lee Maice, of the Hawaii Wing.

Cadets Jan Ericson, Rock Island, Ill.; Robert Hughes, Tulsa, Okla.; Barry Kotler, Highland Park, N. J.; John Seamands, Anchorage, Alaska; and Ronald South, Syracuse, N. Y., have gone to Sweden, accompanied by Capt. Sven Ahlstrom, of the National Capital Wing.

Cadets Joseph Griffith, Grand Island, Neb.; Roy Harris, Augusta, Ga.; Ralph Marcus, Grosse Pt., Mich.; Gordon Meisel, Great Falls, Mont.; and Edward Rosenbeck, Waterbury, Conn., are in Switzerland, accompanied by Lt. Col. William Spain, of the Virginia Wing.

Cadets Wilfrid Chapdelaine, West Warwick, R. I.; Charleton Ferreira, Honolulu, T. H.; Leon Gudry, Jr., New Orleans, La.; Robert Maguire, Jamaica Plain, Mass.; and Nicholas Mammarelli, Nashville, Tenn., have gone to Italy, accompanied by Major Thomas McIntyre, of the Mississippi Wing.

Cadets Donald Diener, Selah, Wash.; Robert Musberger, Missoula, Mont.; John Ohrenberger, Traverse City, Mich.; Robert L. Piehler, Chicago; and Thomas Standring, Boston, are in Mexico, accompanied by Chaplain (Lt. Col.) William A. Weiss, of the Illinois Wing.

Cadets Edward Correll, Monroe, N. C.; Wendell McLaughlin, Allentown, Pa.; Clement Reddick, Columbia, S. C.; Kenneth Thomas, Lexington, Ohio; and Marion Williams, Abilene, Texas, have gone to Denmark, accompanied by Major Karl E. Ording, of the Minnesota Wing.

Cadets Dale Alyea, Pueblo, Colo.; William Fehr, Sunbury, Pa.; Warren Porter, Washington, D. C.; Norman Runge, Omaha, Neb.; and Robert Scott, Phoenix, Ariz., are in France, accompanied by Lt. Col. Herman H. Gough, of the Ohio Wing.

Cadets Robert Babl, Rock Rapids, Iowa; Daniel Dillon, Portsmouth, N. H.; Robert Guilfoos, Romulus, N. Y.; Clyde Kerr, Rumford, Maine; and James Lucchesi, Milwaukee, have gone to Brazil, accompanied by Major Harold E. Sanford, of the New Mexico Wing.

Cadets Robert Fuller, Downey, Calif.; Bradford Haas, Falls Church, Va.; Milton Johnston, Crossett, Ark.; Ronald Kaykendall, Terre Haute, Ind.; and William Sandusky, Kansas City, Mo., are in Belgium, accompanied by Major Norman R. Dickinson, of the Wyoming Wing.

Cadets Garland Adams, Chattanooga, Tenn.; William Allston, Pineville, La.; Lyle Barron, Carlsbad, N. M.; Robert Bentley, Atlanta, Ga.; Garry Biggelston, Jacksonville, Ala.; Dan Cannon, Allentown, Pa.; Charles Castro, St. Louis; Jack Cortright, Charleston, S. C.; Frank Cummings, Richmond, Va.; Rodney Jungle, Tucson; Edward Dunker, Glen Burnie, Md.; John Faulkenbury, Concord, N. C.; Francis Gomes, Honolulu; Gerald Howard, Martinsburg, W. Va.; Robert Keenan, Spring Valley, Calif.; Glandon Laing, W. Nyack, N. Y.; Ronald Loomis, Tulsa, Okla.; Jay Morrison, La Junta, Colo.; Richard Park, Des Moines, Ia.; Howard Peek, Wichita, Kans.; Roberto Diaz, Ponce, P. R.; Robert Seaborn, Grand Prairie, Tex.; Ronald Spencer, Ft. Lauderdale, Fla.; Tommy Spencer, Little Rock, Ark.; and Richard Thurgood, Bountiful, Utah, have been exchanged to Canada, accompanied by Chaplain (Lt. Col.) Charles Naftzger, of the Indiana Wing.

To England, accompanied by Chaplain (Lt. Col.) Robert Smoot, have gone Cadets Edward Arnold, Lander, Wyo.; Peter Betz, River Edge, N. J.; Robert Bowman, Los Angeles; Thomas Bush, New Haven, Conn.; Bruce Casassa, Keene, N. H.; John Chesire, Twin Falls, Idaho; Ronald Ciminski, International Falls, Minn.; Donald Doiron, Springvale, Me.; Albert Eaton, Medford, Ore.; Theodore Foxworthy, Indianapolis; Chester Horlick, Youngstown, O.; Bernard Horwitz, Newport, R. I.; George A. Le Veille, Everett, Mass.; Joseph Mackey, Norwood, N. Y.; Alvah Matteo, Staunton, Va.; Thomas Mueller, Chicago; Allen Okoniewski, Wilmington, Del.; Grady Park, Ocala, Fla.; Kerry Rabenold, Allentown, Pa.; Arnold Sanders, Dearborn, Mich.; Robert Scott, Amarillo, Tex.; Frederick Siegmund, Mobile, Ala.; Leo Stone, Bowman, N. D.; Donald Varney, Renton, Wash.; John Zufelt, Sheboygan, Wis.

LT. MACDONALD GOODWIN, of the National Capital Wing, confronts the camera at Congressional Airport. Mac, who learned to fly at 16, recently passed his flight examiner's exam qualifying him to give flight and written tests for student and private tickets. Now with Bendix Aviation, Lt. Goodwin once tested for T'Craft, flew gliders in the AAF and instructed under the GI bill. Mrs. G. is also a CAP member.

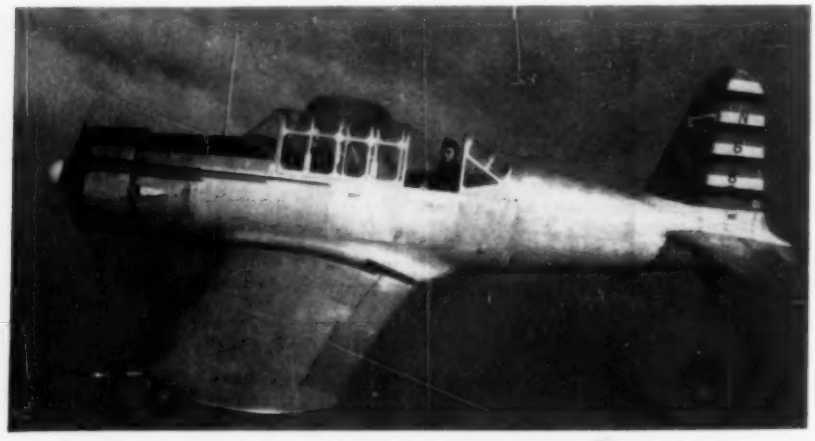
The 1952 International Cadet Exchange will end appropriately in a reception at the United Nations headquarters and a typical "Exchange" fete in Manhattan, and will include a White House reception for a representative group from the I.C.E.

ALASKA BLOOD DRIVE . . .

CAP's Alaska commander, Col. Jack Carr, veteran bush pilot, spear-headed a blood drive for the ARC that went over big on his keynote in appealing for cooperation: "When you give your blood, you give something only you can give, part of your own life . . ."

GIRLS, ONLY . . .

Of all the 40 some encampments of Civil Air Patrol this summer, perhaps the most unique was the all-girl camp at San Antonio's Lackland AF Base. Not that this was the only cadet encampment to have girl participants, but this one was the only two-week camp to be composed of one CAP gal from each continental wing of CAPatrol. Col. Frances Nolde, national adviser for women's activities, dreamed up the program and pushed it through, to the delight of the WAF who need upcoming material for the ranks of USAF's women. This encampment gave the CAP girls Air Force life and started a few thinking about USAF careers.



HERE'S AN UNUSUAL Vultee BT-13 shot from the California Wing. Lt. I. H. Carter, San Francisco Ops officer, flies from the front while PIO Lt. George Brooks keeps an eye on the photographic ship alongside. Occasion was a scheduled SARCAP, on which a previously reported downed AT-6 was found, lending reality to the exercise.

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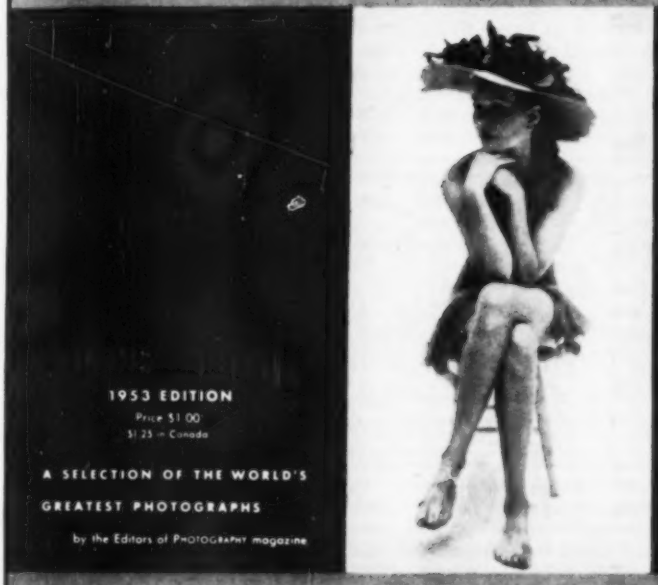

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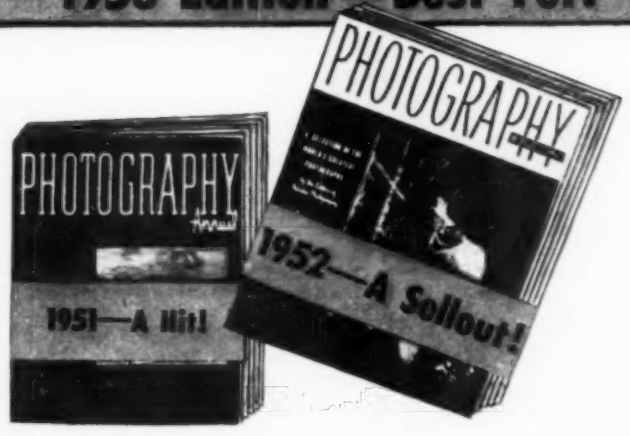

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1. HERE IS HOW "CORONA DISCHARGE" WORKS....
LIKE FAIR WEATHER CLOUDS, YOU HAVE NORMAL ELECTRIC DISTRIBUTION UNTIL
2. YOU FLY INTO A STORM
I'VE GIVEN YOU SOME OF MY OVERLOAD
3. NOW I HAVE TOO MUCH POSITIVE
AND I HAVENT ENOUGH!
NEGATIVE CLOUD
4. SO YOU DISCHARGE INTO CLOUD
THANKS
BANG!!

Weather Wisdom

(Continued from page 23)

drop a positive charge. By repeated splitting up of the drops enormous electrical charges are made available within cloud form. Since the air ascends more rapidly than the drops that it breaks up, it follows that the part of the cloud where updrafts abound will be positive, while the rest will be negative or neutral.

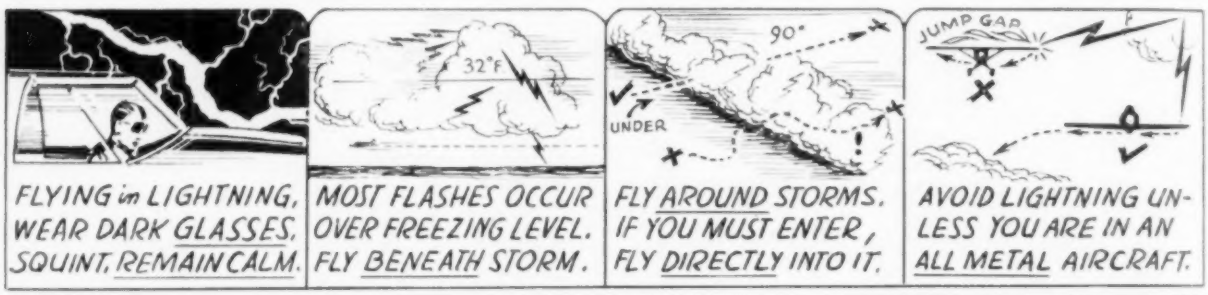
Air tends to take up negative ions while raindrops accumulate the positive. Where there is a great differential, a jagged relief path occurs in the form of a lightning bolt. The actual combining of the two potentials takes some millionths of a second—fast enough to cause tremendous friction and heating accompanied by appropriate noise, thunder.

Most lightning storms are concentrated enough to fly around, but when the storm is a tight cold front wall of cloudform, and once you have decided to cross it, there's no use doing anything but entering it at an exact right angle and heading for the other side like a little bee. Flying below a thunderstorm is rough, but not as rough as flying through it; even flying below is frowned upon, if the terrain below is mountainous.

You can always do worse than to sit out a thunderstorm, particularly the cold front type, for they are turbulent but brief and they leave clear air in their wake.

So-called heat lightning is just plain lightning that is too far away for you to hear its thunder. Small flares of lightning sometimes happen with no apparent thunder. Their power is negligible, with no destructive force whatsoever.

The noise of thunder results from the sudden expansion and contraction of the air as the lightning bolts heat it. Thunder is similar to the expansion and contraction of air at the muzzle of a gun when it is discharged. Echoes from the initial explosive discharge continue for half a minute or more and constitute the rumbling of thunder.


FLYING in LIGHTNING, WEAR DARK GLASSES, SQUINT, REMAIN CALM.
32°F
MOST FLASHES OCCUR OVER FREEZING LEVEL. FLY BENEATH STORM.
90°
UNDER
FLY AROUND STORMS. IF YOU MUST ENTER, FLY DIRECTLY INTO IT.
JUMP GAP
AVOID LIGHTNING UNLESS YOU ARE IN AN ALL METAL AIRCRAFT.

Domestic Air Freight

(Continued from page 29)

Transportation in Chicago recently, Walter H. Johnson, Jr., of American Airlines, discussed some of the economics involved in mass air freight shipments.

"I am convinced," he told the traffic experts, "that sound cost analysis in the field of distribution will prove that great economies are possible through the use of air transportation—that the principles of reduced inventory, faster turnover, decreased cost of packaging, insurance, overhead and interest, at one phase or another of the distribution process, offer opportunity for substantial savings in the cost of doing business.

"There is a simple principle built upon the difference between transportation cost and transportation charges which contains the secret of air freight growth. It is frequently more economical to increase transportation charges so that transportation costs can be reduced. In other words, a more expensive form of transportation—air transport—can reduce the other factors in the distribution scheme, resulting in lower total transportation costs.

"We in the air freight business are under no illusion as to our competitive position. Sixty per cent of rail freight volume is a product of mine or forest and will never be potential for air transportation. Thirty-eight per cent more is of a natural resource or manufactured nature that does not lend itself to economical movement by air. Two or three per cent of rail freight transportation in the merchandise field represents a possible diversion. Beyond that, we are faced with the same problem as in the passenger business—a healthy, vigorous growth requires development of new traffic; it requires development of new markets, changing distribution systems, and the development of new products through the medium of national overnight distribution, which can be—and is now—being provided by the air lines."

As shipping volume increases and new planes, specially designed for freight work, take to the skies, present air freight costs will come down considerably. Best preview of how such costs can be dropped with high load factors was provided last year by Slick Airways hauling air freight coast-to-coast on a Navy contract. Using C-46's—with DC-6A's the prices would have been even lower—and keeping the load factor as high as 98 per cent, the company was able to bring the price for the New York to Philadelphia leg down to $6.60 a ton, as against $19.20 a ton charged for the same loads over the same mileage by truck operators.

On the longer New York to California flights, Slick charged the Navy only 11.2 cents a ton mile, which is two cents a ton mile less than is charged by rail express.

Cargo Control

Helping to lower air freight costs, too, are the many innovations being introduced by all carriers in handling freight on the ground, in loading and unloading procedures and aboard their planes. To guarantee a smoother, more uniform flow of freight along its coast-to-coast system, American Airlines has installed a new cargo control system. Under this set-up, each AA city is allocated sufficient weight on specific flights to meet its normal demand, which is determined on the basis of periodic analysis.

Key component of the plan is a Routing Guide with a sheet for each of the 68 cities served. This guide tells each station how to route shipments to every other city on the system. Umpiring the whole plan is the Cargo Coordinating Control, located at New York City's LaGuardia Field. As long as a station is within its weight allocation on any particular flight, it needs only to put the shipments aboard the flights designated in the Routing Guide. If its demands exceed its allotted weight it refers by phone or teletype to LaGuardia Field for instruc-

tions on whether to reroute the shipment, to hold it, or send it on the specified flight.

Cargo Coordinating Control knows the system's overall picture at all times and can make decisions quickly. This system had its first major test during the 1951 Christmas rush when nearly 4,000,000 ton miles of air freight was moved by AA without a hitch.

In addition to speeding up and smoothing out its flow of air freight, American Airlines is conducting a series of campaigns to develop new air cargo business. This drive has two elements: (1) a general effort in which all non-cargo sales personnel devote at least double their normal allotment of time to air freight sales; and (2) cargo "blitzes" in major AA air freight cities. Each blitz is a week long. During this week all sales personnel devote full-time to air freight sales.

Dock Speed Handling

One of the chief features of United Airlines' air freight service is the extensive use of mechanized equipment in the ground handling of cargo. At Chicago, United has a cargo dock that permits trucks to be loaded and unloaded in half the usual time. The dock consists of a concrete ramp, measuring 25 by 50 feet and standing at tailgate level. It is constructed so that four trucks can be loaded or unloaded simultaneously. Incoming truck shipments are placed on pallets resting on roller runways which extend the entire width of the ramp. When a pallet is loaded, a checker labels the shipment and the pallet is pushed over the roller runway to the other end of the ramp where fork lifts remove it to the proper storage rack or outgoing cargo cart.

Only two checkers are needed to handle the four freight doors during peak shipping hours. Their job is eased by an intercom system and pneumatic tubes which connect the dock, air freight office and loading ramp so that paper work, money transactions and general handling are completed without walking back and forth.

Like American Airlines, United has a system of centralized payload control. Allotment of space on their *Cargoliners* is directed from Denver, where the company has its operating base.

The Flying Tiger Line has just inaugurated a service which offers its air freight shippers a ground truck delivery within a 100-mile radius of its air freight terminals across the country.

Perishables Protected

Slick Airways, on its coast-to-coast air freight flights, flown with DC-6's, can control the cabin temperature and humidity, a great help to shippers of perishable fruits or flowers.

With a nightly schedule from Miami to New York City, U. S. Airlines, which also has a CAB certificate for all-freight operations, has built a big trade in tropical fish, fresh flowers, and fresh seafood for Manhattan restaurants.

The variety of domestic air freight cargos is endless. TWA reports that on some of its all-freight flights the manifest lists as many as 1,200 different items. Unusual items handled by United's cargo men include whale meat, radio isotopes, Egyptian mummies, bloodworms, tropical fish, a wooden Indian, racing cars, Queen Mary's hand-stitched rug, a mechanical kidney, a 160-foot radio tower, a 7,300 pound driveshaft for a disabled tanker, and practically every kind of animal—wild or tame—you can name. For several seasons, United has flown millions of ladybugs from Sacramento, Calif., to the wheat country. Farmers pay $3 a gallon for the larvae. The ladybugs help to keep wheat crops free of scale and aphids.

Currently, United is handling shipments of human breath, bottled in vacuum containers. The breath is that of civilian workers exposed to radio-active compounds at a West Coast Navy Yard. As a safety precaution, routine examples of their exhalations are sent to the National Bureau of Standards in Washington, D. C., for lab tests.

No shipment, no matter how unique, surprises an air freight man today. That in itself—the routine way in which they accept and handle everything from baby elephants to gold bullion—indicates the grown-up character of the U. S. Air freight business.

A real eye-opener is the recent forecast by E. L. Dare, manager of cargo sales for United Airlines. In 1952, he says, United Airlines' cargo division alone will gross more than United Airlines' total operating revenues, including passenger income, added up to just 10 years ago. END

CESSNA SALES CONFERENCE

That all is not dark in the field of personal aircraft manufacture was attested by the note of universal optimism prevailing at the mid-year meeting of the Cessna Sales and Distributors organization.

Hailing from every state and territory of the Union, and several neighboring countries, upward of 500 Cessna dealers and distributors converged on Wichita for a briefing on policy and prospects.

Keynoting the meeting was the opening address of President Duane Wallace whose analysis of the personal plane in American business set the pace for the program.

Under the direction of Sales Vice President Don Flower, the Dealers and Distributors exchanged experience throughout the meeting in a series of well-planned presentations.

The educational impact of the salesmanship demonstrations was of undoubted value and reveals an increasing maturity in a field of endeavor that should have almost limitless possibilities—personal plane ownership.

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LOGGING TIME

WITH HY SHERIDAN
Captain, American Airlines

HAPPYGRAMS

The man who believes in himself may be listening to a liar.

* * *

All young men should go to college. Self-made men have no one to blame but themselves.

* * *

OH, SAY, CAN YOU SEE . . .

Your shy correspondent stumbled upon something that may be of use to you, fellow pilot and gentle reader. Most of our vitamin pills use for Vitamin A a synthetic which is very good and cheap and it will do anything that a well-behaved Vitamin A should do, except one thing. It's not worth a durn so far as helping out night vision is concerned.

If you want to see in the dark you are going to have to go to the dear old cod. Cod liver oil will do the job. The synthetics will not.

* * *

THE PITCH ON REVERSE

Your modest reporter was quite amused by the statement of an airline head, a statement that was widely published, and it looks as though the doughy gentleman is forward looking and is preparing a little court testimony before the accident happens.

He said that pilots of the big airliners have developed a deplorable tendency to land so that they have to depend upon reversing the propellers in order to stop inside the airport which most of us are ambitious to do. What is the truth of this matter?

No pilot should land overly fast, of course. I know of only one case where an airline pilot deliberately did so, and that came to me second hand, rumor. The tale has it that the pilot was rebuffed in his advances to a stewardess. That unenlightened lady, being new, said such was not part of her official duty. This got the pilot in an uproar and so at the next stop he came prancing in and reversed at high speed which spilled the dishes out of the galley shelves onto the floor and that showed her a thing or two.

Anyway, the wing loadings of the airliners are going up and up. One of the new airliners has 80 pounds per square foot, think of that. Everything else being equal, the higher the wing loading the higher the landing speed.

There are two speeds involved in this situation—one is the stall speed and the other is the overshooting speed, and they are approaching each other very fast.

The loading charts of the airlines and of the CAA are based on reversing. That is the truth of it.

The speed margin that a pilot has to work with is being steadily cut down. He has little left to use in gusts to avoid stalls on approaches.

Flare-outs for landing have to be done very gently or you get a high speed stall or a mushing. You pull up the nose and the airliner doesn't pay any attention. The need for a gentle flare-out means that the approach path has to be shallow, and that means two things.

It means that the Doodle Committee advice to pilots, to approach high and descend steeply in order to keep noise out of cities, will make for sharp flare-outs.

Or it means that the pilot must come in on a shallow glide and this requires that he skin obstructions. Anyone knows what will result from that. Suppose that you are approaching in the rain and have no bifocal vision through the windshield and you have to skin over some stacks. And suppose there is a down gust. See?

* * *

ALAS, A LACK

It is not a little knowledge that takes a fellow off;
It's being unaware that the rest exists, is so;
Here he lies amolding, no longer warm and mellow:
He didn't know that he didn't know what he didn't know.

* * *

IT'S WORSE IN WINTER

The girls on our airliners have a job what is a job. Take a dinky old Dizzy Six. It holds 52 to 58 passengers and they have coats. The stewardesses have to collect all those coats and tag them and carry them to a coat closet and hang them up. Many of the flights are only for an hour or so.

Allowing only 30 seconds a coat for hanging up and 30 for getting down, one minute a coat, that's 50 minutes and a bit for 52 passengers. Divided between two girls, that's 25 minutes just decoating and coating the passengers.

So your bard of the skies has come up with the following elegy:

Stewardess Lament

Coats. Coats.
Hang 'em up and take 'em down.
Coats. Coats.
Hang 'em up and take 'em down.
Coats! Coats Coats!
How we ache in back and knee,
How we moan.
Like other beasts mankind should be,
And grow his own.

It Ain't Necessarily So

(Continued from page 31)

clearance can then be arranged if arrival at the terminal airport is still an urgent necessity.

Assuming that your radio is functioning properly, inspection of your source of frequency information (aeronautical charts, etc.) will reveal that most towers have multi-transmitting channels available, assigned to various phases of the control operation. The old reliable low frequency is shared by the "Tower" (runway controller), Ground Control and Approach Control. The VHF's are more exclusive. Look them up and use them appropriately.

In some locations, the Airmen's Guide points out, all inbound aircraft are requested to contact Approach Control, regardless of weather. If you don't, you will get a quick reminder. This is not just a technicality, but a necessary "buffer" against the jamming of the Tower's Local Control frequency during peak periods. Also, during IFR, when Approach Control is the key activity, there is no disturbing change in the procedure.

Pilots have found irksome, if not downright dangerous, the necessity for re-tuning the usual tunable VHF receiver in lightplanes from Tower to Ground Control, or vice versa, as they progress from one phase of the arrival or departure operation to the other. Inasmuch as most light aircraft with VHF receivers already possess a low frequency range receiver, a little trick can be used to give the non-professional most of the ease of the airline type multi-crystal-controlled VHF receivers.

As you approach a busy tower, you will usually find both the VHF and low frequency transmitters in use. Before calling, tune your LF receiver to the appropriate setting, check for satisfactory reception, then turn the volume down enough to avoid distraction. Now operate as before with the VHF receiver. When you have landed, and as you clear the active runway, it is a simple matter without an extended period of "head down and locked" to turn down the VHF volume and turn up the LF volume and ask Ground Control to give you taxi instructions on that frequency. Voila! Reverse the procedure when you are ready to taxi out. You are already tuned to Ground Control on LF and Tower on VHF. You will be happy, and you have no idea how happy it makes the controllers.

Airport Approach Aids

The subject of instrument flying fascinates all pilots except the professionals who do it as a daily diet. Instrument approach aids are generally regarded as being only for the experts under the exciting conditions of low instrument minimums. The average personal pilot shuns "solid" instrument weather as such, quite properly, but marginal weather sneaks up on all of us once in a while.

Under such circumstances, only an old-time local "senior pilot" can pick his way into an airport by reference to local landmarks as they pass under him. He knows what altitudes are safe where, but some-

times even he gets lost.

The unfamiliar pilot usually engages in highly hazardous and generally futile "passes" at the airport vicinity. If he doesn't hit something first, he may never find the airport or align himself with a runway. Meanwhile he is causing pyramiding delays to all outbound and inbound traffic because no controller will allow an aircraft to take off or approach while our friend is groping around.

Many pilots will piously admonish him for getting into the situation, but that's no help. Others will suggest choosing a small satellite field outside the low visibility area and terminating there. Meanwhile, due to unexpected deterioration of the weather or other justifiable circumstance, our pilot is in a predicament. Now what?

Almost invariably, control airports have associated low frequency navigational radio facilities so located that, with a little VFR practice on any range, a competent VFR pilot can use this facility to pinpoint himself. Then he can follow a specific course to the airport or take a heading, wind drift considered, that will lead him there.

Similarly, if the pilot has either an ADF or VHF receiver (omni type) with localizer facility, he can pinpoint not only the airport but, quite often, the active runway. He does not need to go into the detail of full IFR approach procedure, but a bit of practice in the use of these facilities as a regular aid in low visibility or marginal VFR conditions makes for a safer operation and eliminates time lost in useless and hazardous wandering. Such aids are universal in character and are usable anywhere.

Learn where these facilities are available and how to use them. It's more fun to practice such approaches than to practice any other phase of the art of flying and you will increase the safety, efficiency and scope of your cross-country flying. Don't get lost in conditions not normally considered "instrument." This happens too often, and often at night in CAVU.

Save your short field, slow approaches for just such fields. When arriving at or departing from a busy terminal airport, realize that other taxpayers want to use that same runway, usually at almost the same time.

Fast power approaches to long, paved runways, and landings spotted for the most convenient taxi-strip—these mark the really sharp lightplane pilot. Similarly, prompt departure after accepting an "immediate takeoff" clearance, and an early turn at lowest safe altitude to clear the takeoff path will endear you both to controllers and to all other pilots.

The proper technique in handling radio and aircraft at or around busy airports will quickly "adjust" the non-professional pilot. In short order, he will find that he has become "one of the boys," welcome anywhere, at any high intensity terminal airport. END

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Where Am I?

2) There can be no doubt that the Kremlin considers this unusually constructed building a primary target.

3) Anyone visiting Bell Aircraft Corp. would detour a few miles to see what is partially pictured here.

4) You'll not fly over too many of these but when you do see one it makes a fine landmark in usually rugged country. They're beehives of activity.

One of the rewards of flying is an intimate knowledge of the face of our country. In successive issues of FLYING we will carry aerial views of landscapes with distinguishing markings. It's up to you to figure out the location. If you remember them all you will eventually have a pretty good idea of America.

SEE PAGE 63 FOR ANSWERS

5) In the center of this picture, one-half inch from the bottom, is a square monumental rock indicating the peak as the highest point in the U. S.

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Destination Space

(*Continued from page 12*)

moderate during the Martian day but low at night; any life which does exist must therefore be hardy. It is probably a form of vegetation; lichens have often been suggested as the type of life existing there.

Mars has three dominant terrain features: (a) thin polar caps of ice or frost, (b) brown or reddish areas believed to be deserts, and (c) greenish-blue areas which probably derive their color from vegetation. These regions of apparent vegetation change according to the Martian seasons, the green or blue areas changing in color and enlarging during the spring and summer when the ice caps recede and finally disappear. The famous Martian "canals" have not been explained; there is nothing, however, to substantiate the idea that these are artificial waterways constructed by intelligent beings. Such beings may have inhabited Mars at some time in solar history but there is no indication that they exist today.

Mars has two tiny moons which are only about five and 10 miles in diameter. The planet itself is one of the smallest in the solar system, possessing a diameter only slightly greater than one-half the Earth's. Although it has considerably less volume than does our planet, its land area is almost equal to our own because Mars has no seas or oceans.

Mars' outer neighbor is Jupiter, largest planet of the solar system. This mammoth has a diameter greater than 80,000 miles. Beyond Jupiter lies Saturn—famous for its colorful rings consisting of small particles probably from a shattered Saturnian moon—then Uranus, then Neptune. These four are known as the giant planets and, because of the traits which they have in common, are usually considered as a group.

Jupiter is 480 million miles from the Sun; Saturn is 880 million, Uranus nearly two billion, and Neptune almost three billion miles. Being so far removed from the Sun and from its heat, the four giants have extremely low temperatures in the order of 200 and 300 degrees below zero. They probably possess great quantities of ice and their deep atmospheres abound in methane, ammonia, and hydrogen. For man, they are the least hospitable of the planets; their temperatures and atmospheres undoubtedly deny the existence or survival of any life on their weird surfaces. All four have moons, ranging from Neptune's two to Jupiter's 12. Although the giants themselves are too hostile to permit man to set foot on them, he might find their moons suitable as landing places.

Pluto is the ninth, most remote, and second smallest planet. Only 3,600 miles in diameter, it was not discovered until 1930. Little is known about this world except that it must be extremely cold and poorly illuminated because it is almost four billion miles from the Sun. Pluto is not a promising world for interplanetary explorers.

The Stars

Beyond Pluto lie the stars. Whereas the planets shine only by reflected sunlight, the stars are luminous bodies which create their own light. Each star is essentially another sun and, like ours, may have its own planetary system. Such planets—and there may be thousands, even millions, of them—could have temperatures and atmospheres favorable to both vegetable and animal life. Because of the large number of these other worlds, it is more probable that, if intelligent life exists elsewhere in the Universe, it will be found on the planets of other stars rather than on the planets of our solar system.

The nearest star, other than the Sun, is more than 25 *trillion* miles away or slightly over four light years. To make a round trip to this star would take almost nine years if we could get there and back at the speed of light, an incredible 186,000 miles per second. Travel at this speed or at anywhere near this speed would present problems which today are not even understood. Because of these obstacles presented by the distances to the stars and the speeds necessary to reach them, it is possible that interstellar travel—potentially the most promising of all space flight—may prove to be an impossibility.

The Timetable

Man's timetable for the conquest of space will begin when his level of engineering achievement and economic feasibility enables him to reach the Moon. Flight throughout the solar system will be next and, where possible, landings will be made on the planets, notably Mars, and on their moons. Travel to the stars—a possibility more than a probability—may follow.

(The next article in this series will describe the nature of the rocket, the device by which man will be able to leave the Earth and put this timetable into effect.) END

Percival Provost

(*Continued from page 35*)

the *Provost* is slightly heavier, twice as powerful, and more complicated than the *Prentice*. Flight performance, particularly rate of climb, is said to be something service instructors have long dreamed about. Roll rate and handling are akin to the best type of fighter.

Certainly the *Provost* will be quite a handful for *ab-initio* pupils but is expected to disclose their "ability-to-split-attention factor" right at the start. The ultimate aim is to reduce overall failure cost throughout the Command.

Structurally, the *Provost* is a straightforward job, with the design accent on weight paring and first class handling qualities. Rapid rate of climb, desirable to get the pupil quickly to aerobatic and spinning height and give fullest tuition time in the air, is helped by the powerful 550 hp Alvis Leonides 25 direct-injection nine-cylinder radial. Power is so plentiful in fact that there is sound argument for a derated 500 hp model of this engine with the opportunity taken to increase still further the time between major overhauls—doubly important on the hard-worked basic trainer.

Cowling is a low-drag, double skinned, ducted type with fixed outlets each side at the rear to eliminate the weight and complication of adjustable gills. Induced flow through the cowling is assisted by the suction effect of the airflow over the top of the wing, but the opening had to be positioned carefully to avoid tail buffeting. Tropical cooling tests have proved that the cowling is completely efficient as well as simple.

Both engine side covers are quickly detachable for servicing; the bottom one, in-

corporating air intake and oil cooler ducting, hinges down for access. Attachments are at the front to the nose ring rubber-mounted on the cylinder heads, and at the rear to a triangulated truss engine mount with four attachment points at the firewall. "Power eggs" are no longer favored in the RAF, present method being to change the bare engine and not the complete installation—cost being the critical factor. Accessories gearbox, with compressor, vacuum pump, and starter, is therefore mounted directly on the engine, and not remotely on the firewall driven by a shaft.

Neat cowling of the small-diameter Leonides has resulted in good forward view even in the nose-up taxiing condition. Accommodation in the roomy, 45-inch-wide cockpit is for instructor and pupil side-by-side. The third seat specified in earlier machines, which it was thought would give another occupant air experience, proved to be little used and has been omitted.

Canopy Takes 52G

The canopy is in three sections: a heavily framed front screen, with flat panel for best visibility and to facilitate erection of the inner amber night simulation screens; rear-sliding center piece, stressed to stay put in any position after up-to-25G impacts; rear fixed Perspex molding. The strong canopy is supported by a heavy crash tripod designed to withstand four times the aircraft gross weight in the event of a turnover.

Seats and harness, too, are strengthened for 25G crash impacts. Harness prevents the crew from being thrown against the dash in a crash, but does not restrict the crew's normal control movements.

Cockpit tailoring has not progressed in the RAF to the extent indicated by American standardized schemes, but many pilot's points are incorporated in the *Provost's* layout. Quadrant throttles, more sensitive than the slide types standardized for slower-responding jets, are positioned on the port wall and a central console, falling easily to each pilot's left hand. Instrument grouping is arranged logically around the standard RAF blind flying panel. Stick grip is medico-designed, cants to the left to take account of the fact that a pilot's arm does not sprout from the middle of his chest, has palm-heel rest, correctly positioned thumb buttons, and an offset brake lever. Rudder bar and seat adjustment is quick, easy against spring and bungee loading.

Radio Aids

Radio carried in the aft fuselage includes a VHF general purpose transmitter-receiver, beam approach and marker beacon receivers. Approach aids permit training to continue during the indifferent weather experienced for much of the year in the British Isles, thus increasing total flying hours per plane/year and, logically, pupil output. They also familiarize the pupil with such equipment at an early stage.

Blind flying training in daylight is done by means of extendible "two-stage" amber screens which together with blue-tinted goggles worn by the pupil prevent forward vision. Use of these aids on the *Prentice* has markedly improved the general standard of instrument flying among new RAF crews. There is also full provision for normal night training.

Easy maintenance, desirable feature of any training craft, is built into the *Provost* by provision of numerous access doors situated so that the maximum number of ground crew can work on the plane at the same time. Detail design has insured a good degree of interchangeability of components, including the halves of the tailplane.

Specifications

At an all-up weight of 4,250 lbs. including two crew and 79 gallons of fuel, maximum speed is 200 mph at 2,500 ft.; maximum continuous cruise at 2,000 ft. 178 mph; stall, flaps down, 67 mph; initial rate of climb 2,200 ft. per min.; time to 5,000 ft. 3.3 min. and to 10,000 ft. 6.5 min.; service ceiling 2,500 ft.; roll rate 90 degrees per second; take-off to 50 ft. (still air, grass surface) 580 ft.; range and duration of cruising at 55 per cent take-off power at 5,000 ft. (no allowance) 510 miles and 3 hrs. 8 min. at 162 mph. Power loading at take-off is 7.7 lb./hp. and wing loading at full load 19.85. Span is 35 ft. 2 in.; length 29 ft.; tail down height 8 ft. 10½ in.; wing area 214 sq. ft.; aspect ratio 5.78.

Royal Air Force intermediate or advanced trainer policy is also becoming clearer, for three other trainers to be procured this year are the side-by-side seating *Balliol* and *Vampire* T.11 jet, and the *Canberra* T.4. Complete training may thus be via the *Provost*, *Balliol*, *Vampire*, and/or *Canberra*, with perhaps a brief operational course before squadron service. END

Parachute Pioneers

(Continued from page 25)

a convenient and appropriate spot for such a risky adventure. The descent, the first parachute jump over England, had taken about 10 minutes.

The notion of falling safely through the air had been dreamed about for a long time. Ancient legends of China and Siam show that the people of those countries may have been familiar with the theory of the parachute. In Western history the parachute was first mentioned in the fifteenth century by that wonder man of the Italian Renaissance, Leonardo da Vinci, who sketched a man descending from a height under a pyramid-shaped canopy. About 80 years later a Venetian named Fausto Veranzio described a square sail-like parachute, but there is no evidence that either man's notions ever got past the theoretical stage.

In 1783, the French brothers Montgolfier, Joseph and Etienne, invented the balloon. To gather data for their experiments they tied canopies to baskets in which they dropped animals from considerable heights. But these experiments were concerned with getting up into the air and not getting down out of it. As a youth, Joseph Motgolfier himself jumped from the roof of a house, using a

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blanket as a parachute.

Fire Escape

The year 1783 also marks the first authentic parachute jump, but it was not made from a balloon. Commencing his parachute experiments by leaping from a one-story height, the French physicist, Sebastien Lenormand, gradually increased the heights, prudently dropping animals first. Finally, he made a successful jump from the high tower of Montpellier Observatory. The good Professor may have had flying ultimately in mind but his parachute was intended only for use as a fire escape. This idea never took hold but Lenormand had demonstrated that man could fall and land safely from dangerous heights.

Though credit is generally given to Garnerin for the first parachute descent from a balloon, this honor may belong to another noted aeronaut of the period, Jean Pierre Blanchard. He claimed to have made an emergency jump from a balloon in 1793 and to have broken his leg on landing. If that is true, he has the doubtful distinction of being the first of a long line of parachutists to do so. The first emergency jump is conceded to the Polish Jordaki Kuparento, in 1808. Over Warsaw his balloon caught fire, a common mishap. Cutting his parachute loose, Kuparento descended safely to the ground and into the pages of history.

Except for an accident, the first parachute jump from a balloon might have been carried out by an Englishman in 1785. A British ex-sailor, Arnold by name, was to pilot a balloon one mile above London for the express purpose of letting "A Gentleman down by Parachute," namely the stalwart Mr. Appleby, also a British ex-tar. Arnold and his youthful son took their places in the balloon basket. Appleby nonchalantly seated himself in the cradle-like car of the parachute.

As the balloon began to rise, it hit a series of obstacles, knocking Arnold Senior and Appleby to the ground. Arnold Junior stayed with it and eventually came down in the Thames River, suffering nothing worse than a good wetting. In fact, when some bystanders tried to make off with the wrecked balloon, the stout lad gave them a trouncing. England was to see no more parachuting until Garnerin came along.

Umbrella Style

Garnerin's jump in England was by no means his first. Apparently familiar with Lenormand's experiments, he constructed a giant canvas-covered umbrella, 23 feet in diameter. On October 22, 1797, he took it up by balloon outside Paris. At 3,000 feet he boldly cut the retaining cord. To add to the drama, the balloon exploded directly afterwards and, according to an eyewitness, "the parachute began to descend with such rapidity, that a cry of horror escaped from the spectators, and several sensitive ladies fainted." But the parachute soon slowed down and the young aeronaut landed intact to receive an ovation. It was the first authenticated time in history that a man had deliberately descended from a balloon by parachute.

As most of the early parachutists were Frenchmen the word naturally is of French derivation and so from Latin. *Para*, a French prefix meaning "to protect from," and *chute*, meaning a fall, give us "to protect from a fall," which is just what a parachute does.

Among those present at Garnerin's London leap was 25-year-old Robert Cocking, a painter. Watching those sickening oscillations he decided to seek a way to prevent them. Young Cocking had noticed that a falling umbrella fell in a straight line after assuming the position of apex pointing down. Believing that the inverted umbrella was the proper shape for a parachute, he went to work on one. But it was not until 1837, when he was 60, that he tested his theory. Using many braces and struts he had put together a rigid cone-shaped linen-covered framework about 100 feet high, with the apex pointing down, under which was a basket where he was to sit.

After much difficulty Cocking succeeded in obtaining the use of the gigantic Nassau Balloon, the only one large enough to lift his heavy contraption. On a clear summer night, in spite of warnings from skeptical onlookers, he made the ascent. Charles Green, famed balloonist of the day who piloted the balloon, was also among the skeptics and refused the responsibility of cutting the parachute loose. Before the ascent Cocking had to agree to do so himself. When they were a mile high, according to Green's account afterward, he made a last effort to persuade Cocking not to carry out the jump. The dauntless old dreamer would not be persuaded.

"All ready?" he called.

"All ready."

"Good night, Mr. Green."

"Good night, Mr. Cocking."

"A pleasant voyage to you, Mr. Green. Good night."

Cocking released the parachute. It fell in a straight line. Then it began to lurch. The braces and supports collapsed. The basket tore loose from the frame and the luckless Cocking was killed in the plunge to earth. In trying to strengthen his parachute he had given it far too much weight, and the diameter was much too small for the load imposed on it. However, his basic design is considered by experts to be feasible if properly engineered.

Progress Slowed

Cocking's death resulted in an outcry against parachuting as useless and dangerous. For while the balloonists were seeking ways of controlling flight and conquering the air, the parachute descents contributed nothing more than a thrill for the spectators and some cash for the jumper if he could get it from the spectators. For the next 50 years or so, the only parachutists were professional stunt men who entertained crowds at fairs and carnivals on Sunday afternoons.

It was not until the 1880's that a significant advance was made in parachuting. Captain Thomas Baldwin, one-time circus acrobat now famed in American aviation, did away with the rigid framework from which the canopy hung. From his own parachuting experience Baldwin believed that a frameless canopy of the correct size and shape would automatically fill with air and retard descent.

Baldwin designed a non-rigid parachute of his own, tested it with animals and proposed to the manager of the San Francisco Golden Gate Park that he make a jump. Needing a crowd attraction, the manager agreed, and one Sunday afternoon in November, 1885, Thomas Baldwin made $1,000 and parachute history by jumping from a balloon at 1,000 feet with a non-rigid parachute. This was the innovation that made the parachute usable with the airplane, although the Wright Brothers were still 18 years away from Kitty Hawk. The unwieldy, frame-supported canopy of the old parachute, suspended from a leisurely balloon floating on air currents, could never be used on a speedy flying machine.

Minor WWI Use

Further improvements were made by enclosing the parachute in a pack so that it could be carried by the parachutist, and eliminating the basket by attaching the parachute to his body with a harness. But though these improvements were made before 1914, the parachute played a minor role in World War I and many a brave man fell to his death because he had no parachute. Parachute research and development were not taken up in earnest until after the war.

Parachuting is now a science with engineers and technicians working out new designs to take heavier loads and make lighter landings. In war and peace parachutes play vital parts, from dropping troops behind enemy lines to dropping supplies and rescue workers at scenes of disaster. With all the applications of modern science, the parachute remains essentially an air-filled umbrella slowing down the rate of fall, just as it did when pioneered by the daring men of the late eighteenth century. END

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FLYING FARMERS

By BILL RENSHAW

DIME WON'T DO

Got any aviation pet peeves? Here's mine: linemen who never have a screw driver, so try to do with a dime (which they often don't have) a job designed for a screw driver. Warning—don't lend this type of lineman your screw driver. Chances are he'll stick it in his pocket, unintentionally of course, but net results will be the same as if he pilfered it—you'll be out a screw driver.

* * *

INCENTIVE

When blood donations dropped slightly, the McLean County, Ill., flying farmer "wing" offered a free airplane ride to any and all who would sign a blood donor's pledge. It worked. We'll have much more on this later.

* * *

PROGRESSIVE PARTY

There are few things a farmer likes better than to visit his neighbor or to be visited. His liking for palaver across the fence pre-dates the automobile, the radio, and video. Sociologists stewed a generation ago fearing that the automobile and the tractor would destroy the Rural Neighborhood. Instead, modernization merely widened the neighborhood from a three or four-mile area to a ten to 12-mile circle.

With farmers accepting the light airplane, the Rural Neighborhood is again being expanded far beyond the fondest dream of ox driving ancestors. Adams County, Ill., FF's recently demonstrated that neighbors 50 miles away, who have landing strips, can be visited as quickly as their forefathers visited their neighbors a couple of miles down the road.

Using farm landing strips, the flying farmers visited 17 restricted landing strips, all in a 50-mile radius. Longest hop was 30 miles, shortest six miles.

The project disclosed a fine network of farm strips. It also familiarized the FF's with the various strips. This in itself is a big safety factor.

On an average, strips were just a little more than 12 miles apart.

FF's in the 12 participating airplanes discovered that visiting 17 landing strips in a forenoon leaves little time for getting acquainted, so the next flight, according to Dean Searls, one of the prime movers in the visiting program, will be made to 10 or 12 strips, thus allowing a little more time for neighborliness.

FLYING MOTHERS

Mother's Day in the midwest dawned cold and cloudy with an occasional flurry of rain and sleet.

In the intermittent sunshine hundreds of mothers received their first flight in a light plane. Flying farmer pilots reported that many of the mothers showed unusual interest. Many queried, "Could I learn to fly?" Several said "we'll be back for more."

On the basis of reports to date, best salesman was James B. Ahler of Medaryville, Ind., who took 17 mothers for a flight. All FF's who participated will receive a certificate terming them "Ambassadors of Aviation."

Oldest mothers to participate were actually grandmothers. One was 78 years of age, the other 79. Given their flight by Chester Miller, Anderson, Ind., the grandmothers chorused, "Flying is wonderful."

* * *

AWARD FOR MACK

Midwest flying farmers meeting recently in their annual clinic decided that Congressman Peter Mack did more for private aviation in 1951 than any other individual. The Congressman, on a good will mission, recently circled the globe in a Beech *Bonanza*. He was awarded "The Flying Farmer of the Year" degree.

Recipients of earlier awards were a dirt farmer, Harland Waymire, of Madison County, Ind., and Captain Donald L. Mills, USN. To date only three awards have been made.

Waymire helped sell aviation in Madison County to a point where membership is the highest of any county in the nation.

Captain Mills was host to midwestern flying farmers on three separate occasions. His interest and faith in the flying farmer movement earned his last year's award.

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I Learned About Flying

(Continued from page 32)

for a quick take-off. There would be just enough time if I didn't waste any. The wind had gone down and the air was very smooth. The engine purred sweetly. I was glad I could be of help to a desperate farmer.

I turned on carburetor heat, pulled the throttle back part way and began a power approach. I was trying to hold just enough power to carry me over the trees. Then I would chop throttle and settle in on the field. In all the excitement, I didn't notice that my controls were getting mushy and that I had little flying speed left. The next thing I knew, I was settling too fast.

It was too late to add power. My right wing tip had brushed an upper limb of a tree. This stalled me out completely and I made my hardest landing ever. I landed hard enough to crumple the right landing gear and this of course let the prop and the right wing tip strike the ground. I piled out fast.

I wasn't scratched. I was disgusted, mighty disgusted, to think such a thing had happened to me. I had always thought that as long as my engine was with me, I could set her down most anywhere. But the engine had not failed, and I had crashed. My faithful *Cub*—what a sad sight!

Well, I had "landed" and at least my efforts to reach the livestock were not in vain. I opened the gate to let the cows reach dry land and turned the small calves out of their flooded pen. I then fed them from the barn and took care of the horses and hogs.

By this time it was nearly dark and I had no choice but to stay at the isolated farm house until morning. I managed to get a message out by a crossed telephone wire to a woman who called the airport, telling them I was OK but couldn't get home that night. I made myself at home, found something to eat and turned on the radio to hear the flood news.

Then came this startling announcement: A Piper *Cub*, piloted by me, had crashed in the vicinity of Sloan. Pilot and several passengers, they said, were badly injured. Two rescue parties were trying to reach "us." I then phoned the radio station, telling them I was all right, I had no passengers, and to stop the rescue parties. The next morning, after the flood currents had decreased, a couple of neighbors two miles west came after me by boat. Their farm was high and dry but was isolated by miles of water on the road. I called Mapleton airport and they sent a plane to take me home.

What did I learn about flying from this experience? Well, I have made some resolutions which will help keep me out of future trouble. Maybe they will help you too.

(1) As a pilot, you have complete authority to decide what is safe and what isn't. Don't let anyone talk you into something against your better judgment.

(2) Don't be too hasty in making a strange field landing. Look the field over from the air or, if possible, look it over from the ground beforehand. You are better off in the air than tangled up with trees, "invisible" power lines, and who knows what else. Fly over the field at a safe altitude and normal airspeed, looking carefully for obstructions, especially at the far end. Most of all, avoid going into a "hole" where there is no room to land and not enough room to pull out.

(3) Keep up flying speed until you are ready to touch ground. I formerly thought stall warning devices were needed only in hot planes. If my *Cub* had been equipped with one, the beep of the horn might have scared me into pushing enough throttle to clear that last tree. END

Coyote Shooting in Alberta

(Continued from page 16)

partner from inside his own cockpit. However, the farmer proved to be an old friend and took us to town, where we secured another prop, installed it on the *Cub*, and got five more coyotes before sundown.

In Alberta a special permit to shoot coyotes from an aircraft is required. The Superintendent of Game, D. E. Forsland, is most cooperative.

Originally I used BB shot but have found No. 4's preferable. I will not pretend that the shooting is easy. The targets flash by you or you flash by them pretty fast, even for an old duck shot. But it is a satisfaction to rid the countryside of the pests, and hunting by airplane is mighty easy on the feet. END

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